



ASSOCIATION *of*
FISH & WILDLIFE
AGENCIES

The North American Conservation Education Strategy:

Benefits of Outdoor Skills to Health, Learning and Lifestyle: A Literature Review

A white paper of the Association of Fish & Wildlife
Agencies' North American Conservation Education Strategy

Funded by a Multistate Conservation Grant of the Sport
Fish and Wildlife Restoration Program

November 2010

*Produced by:
Cottrell and Associates Environmental Consulting*



Conservation Education = Conservation

Benefits of Outdoor Skills to Health, Learning and Lifestyle: Literature Review

© 2010 Association of Fish & Wildlife Agencies

Acknowledgements

Prepared by:
Stuart Cottrell & Jana Raadik-Cottrell
Cottrell & Associates Environmental Consulting
1613 Peterson Place
Fort Collins, CO 80525
970-481-0014

Note about Cottrell & Associates: Environmental Consulting (CAEC):

CAEC specializes in human dimensions of natural resource tourism research and sustainable tourism development. Dr. Cottrell and his associate Jana Raadik-Cottrell have 20+ years of combined experience in research and tourism development in western and Eastern Europe and the United States. Dr. Cottrell is an Associate Professor in the Department of Human Dimensions of Natural Resources at Colorado State University. Dr. Raadik-Cottrell recently completed her PhD in Human Dimensions of Natural Resources at Colorado State University (CSU). Her dissertation focused on “Construction of community identity in island places: Place meanings through identity processes on Saaremaa Island, Estonia.” Dr. Cottrell worked on a project to examine the Condition of Colorado Public Lands that involved an inventory of outdoor recreation trends, issues and primary management concerns with related indicators for public land agencies in Colorado while Cottrell and Raadik have worked on visitor use studies, emotions towards of wildlife, and tourism development studies in Europe.

This report was developed for the Association of Fish & Wildlife Agencies (AFWA) under contract with CAEC. Funding was provided from a three-year Multistate Conservation Grant of the Sport Fish and Wildlife Restoration Program awarded in 2009, with the purpose to support implementation of the North American Conservation Education Strategy.

Table of Contents

Acknowledgements.....	i
Table of Contents.....	ii
Executive Summary.....	iii
SECTION I. INTRODUCTION.....	1
A. Purpose of Literature Review.....	2
Objectives.....	2
B. Outcomes.....	3
SECTION II. Methods.....	4
A. Literature Search.....	4
Inclusion criteria.....	4
Key terms.....	5
B. Limitations.....	5
SECTION III. Findings.....	6
A. Fear of the woods.....	6
B. Healthy Lifestyles.....	8
C. Minorities and outdoor skills education as a tool to increase outdoor recreation participation and other perceived benefits.....	10
D. Outdoor education possibilities to increase environmental stewardship.....	12
E. Outdoor experience for teens has self-reported life-changing results.....	14
F. Outdoor recreation and health benefits.....	17
G. Outdoor recreation influence on participation and attitudes.....	19
Constraints to hunting and fishing.....	22
Hunting and fishing participation.....	22
H. Program provision.....	23
I. Wildlife Value Orientations.....	25
SECTION IV. CONCLUSIONS AND RECOMMENDATIONS.....	27
A. Conclusions.....	27
B. Recommendations.....	33
C. Future Research.....	35
BIBLIOGRAHPY.....	37
Additional Sources.....	43
Industry reports, websites and related documents.....	43
Thesis and dissertation work on positive impacts of outdoor education.....	44
APPENDIX A: Benefits of Outdoor Adventure.....	46
APPENDIX B: Ideas for the future.....	47
APPENDIX C: Efforts in the U.S. to Connect Youth to the Outdoors.....	55

Executive Summary

Introduction

A literature review of the benefits of outdoor skills education highlights contributions to health, learning and lifestyle in general and fishing and hunting participation in particular. The opportunities offered by outdoor skills education within both natural and social environments illustrate different situations in which these positive connections can be made with the self, others and the environment. Outdoor skills activities such as hunting and fishing provide opportunities for the connection of individuals with nature and the outdoors, direct connection with social networks, and more importantly, with themselves. Specifically, the benefits of these connections lie in the strength and placement of these connections from the leisure context to everyday lives.

The *purpose of this review* of literature was to determine the extent to which positive impacts of outdoor skills education and wildlife related outdoor education are documented with respect to health, lifestyle and student learning. Information that documents the extent to which individuals who participate in outdoor skills education go on to become hunters and anglers was examined as well.

Methods

This report draws on research from adult learning, education (i.e., adventure, boating, conservation, experiential, hunting, fishing, outdoor, physical and wilderness), health, leisure, recreation, sport, therapy, and at-risk-youth to highlight the evidence of the positive contributions of outdoor skills education on hunting, fishing and other outdoor activity participation. Relevant research articles and reports were identified through a search of electronic databases via the Colorado State University library and Goggle Scholar online search engine using outdoor skills education, health, learning and lifestyle as the initial search terms in the context of conservation education. Additional terms were added including hunting / fishing participation, healthy lifestyles, outdoor recreation, adventure education, active living, risk, and leisure constraints. The search yielded a total of 100+ documents that were examined to determine their match with the inclusion criteria (key terms and date of publication mostly mid-1990s to 2010). Documents include industry reports (i.e., Outdoor Industry Foundation, U.S Fish and Wildlife Service, Private and Public Land Use studies, National Survey of Fishing, Hunting, and Wildlife-Associated Recreation, etc.), academic peer-reviewed journals, doctoral dissertations and Masters' theses, NGO reports, and popular media sites online.

Findings

Interpersonal and intrapersonal skills developed through engaging in nature based activities in meaningful ways represent some of the main benefits of outdoor skills education. Benefits for the natural environment are not as readily evident, yet indirectly noted as developing more sensitive individuals and communities towards the environment, and the development of environmental awareness and stewardship ethics. Health and learning benefits were evident in the physical, psychological and spiritual context, specifically with regards to developing self efficacy, intellectual flexibility, personal skills (time management), and relationship building. The benefits that result from participating in outdoor activities can be enhanced through

appropriate facility provision and access to natural resources as well as the design of outdoor skills education programs that work towards specific objectives. Outdoor adventure / skills programs are founded on the belief that outdoor experience enhances learning as a result of cognitive, behavioral, and environmental factors where learning takes place when a person interacts with the environment. Substantial evidence over the years has shown a number of benefits of outdoor education programs for adolescents (Hattie et al., 1997; MacLeod & Allen-Craig, 2004; Neill et al., 2003). In general, these benefits are:

1. Increase self-concept and self-concept domains such as independence, confidence, self-efficacy, and self understanding;
2. Enhance psychological well-being;
3. Increase ability to overcome challenges;
4. Positively impact on leadership competencies;
5. Enhance decision-making skills, general problem solving competencies, academic achievement and academic self-concept;
6. Increase personality dimensions such as assertiveness, emotional stability, achievement motivation, internal locus of control, and maturity and reductions in aggression and neurosis; and
7. Improve mental strength and interpersonal dimensions such as social competence, co-operation and interpersonal communication skills.

In particular to health, learning, and lifestyle, the following benefits of outdoor skills programs are highlighted:

Benefits to Health

- *Outdoor education promotes lifelong physical, emotional and spiritual well-being* - A growing body of studies suggests that contact with nature is as important to children as good nutrition and adequate sleep: time spent outdoors correlates with increased physical activity and fitness in children; exposure to green space reduces crime, increases general wellbeing and ability to focus; children as young as five have shown a significant reduction in the symptoms of Attention Deficit Disorder (ADD) when they are engaged in outdoor activities in natural settings (Holmes, 2007).¹
- Outcomes for physical, emotional and spiritual wellbeing were enhanced when students spent more time outdoors in nature. Research indicates that there could be improvements in nutrition, physical activity, reductions in crime and ADD as a result of outdoor education (Holmes, 2007 and <http://www.coeo.org/documents/RSExecSummary.pdf>).
- In a program directed toward minorities, Hispanic adolescents showed positive gains in conflict resolution skills, stewardship of the environment, and knowledge and understanding of science concepts after a week-long residential outdoor education program for youth at risk (AIR, 2005).²

¹ Holmes, R. (Ed.). (2007). *Reconnecting children through outdoor education*. Toronto, ON: Council of Outdoor Educators of Ontario.

² American Institutes for Research (2005). Effects of outdoor education programs for children in California see http://www.air.org/reports-products/index.cfm?fa=viewContent&content_id=644.

- *Outdoor education educates for character* – Outdoor Education (OE) provides powerful opportunities for extensive personal and interpersonal growth, particularly when trained outdoor educators are involved in all aspects of the program. Several studies have found that:
 - Many character traits are significantly enhanced as a result of OE experiences, including creativity, enthusiasm, self-motivation, self-understanding, assertiveness, maturity, independence, and self-confidence; and
 - Many social skills are also enhanced through OE experiences, including cooperation, effective communication, decision making, problem solving, task leadership, and social competence
(see <http://www.coeo.org/pathways/PW19.4Summer07.pdf>).
- OE promotes marked improvements in behavior for special populations such as at risk youth. Retention and continued growth in these areas is also evident as a result of such hands-on experiences (see <http://www.coeo.org/pathways/PW19.4Summer07.pdf>).
- In a study to examine factors that motivate or constrain outdoor recreation (e.g., fishing) among urban and suburban dwellers in Minnesota, appreciation (i.e., enjoying nature and the outdoors) and health (i.e., stress reduction) were the two greatest motivators (Schroeder et al., 2008). Many studies imply that use and exposure to the outdoors and park-like settings through outdoor activities can improve moods, perceived wellness, and increase longevity. More specifically, access and use of local park and recreation opportunities (e.g., running, cycling, fitness programs) is associated with increased physical activity and such activities are associated with improved health aspects such as lower blood pressure and perceived physiological - psychological health (see review in NRPA, 2008).³
- *Outdoor education directly exposes children and youth to the natural environment in ways that develop powerful, knowledgeable and lifelong connections essential for a healthy and sustainable future.*
 - Research also shows that early, sequenced and repeated experiences in the outdoors develop a kinship with nature that can evolve into an informed, proactive and lifelong stewardship of our natural environment;
 - Children love to be part of the solution – especially when they are able to see the effects of their positive interaction with nature first-hand. (see <http://www.coeo.org/pathways/PW19.4Summer07.pdf> and Holmes, 2007)
- Outdoor pursuits do more than combat obesity and benefit the economy; spending time outside benefits overall wellness and academic achievement. Playing outside improves concentration, motor development, coordination, mental acuity, and mood.⁴
- Time outdoors also reduces attention deficit disorder (ADD) symptoms, lowers blood pressure, and alleviates stress and anxiety.⁵

³ NRPA (2008). Health Partnerships of Recreation and Park Organizations: Results from a Nationwide Study http://www.nrpa.org/uploadedFiles/Explore_Parks_and_Recreation/Research/Health%20Partnerships%20of%20Recreation%20Organizations.pdf

⁴ Colorado Kids Outdoor Initiative http://www.aspenpitkin.com/Portals/0/docs/county/OpenSpace/publicpackets/LtGov's_CKO_Initiative_Report.pdf

⁵ Connecting Today's Kids with Nature. 2008. National Wildlife Federation. 18 May 2009

Benefits to Learning

- Spending time in the open air and learning outside increases students' ability to think creatively and improves problem-solving skills.⁶
- Students who play and learn in outdoor settings perform better on tests, have higher grade point averages (GPAs), and cause fewer classroom disruptions.⁷
- Rickinson et al., (2004, p. 27)⁸ suggest there is “considerable evidence to suggest that outdoor adventure programs can impact positively on young people’s attitudes, beliefs and self-perceptions.” Other benefits include improved academic abilities, awareness of nature and the environment, problem solving, outdoor skills, and values clarification.
- Research shows that students who participated in outdoor education with the local environment as a comprehensive focus and framework for curricula demonstrate increased engagement with and enthusiasm for learning, improved academic performance, and better language skills; have shown greater sense of pride and ownership in accomplishments and a variety of substantially increased critical thinking skills (Holmes, 2007).
- *Reconnecting children through outdoor education, 2007* – is a report of evidence-based research on outdoor and experiential education (OEE) in Canada that shows a relationship between OEE and real-life situations. OEE participants had better engagement and enthusiasm for learning; better academic results; and a greater connection with their achievements as well as improvements in critical thinking.
- Children who are more active outdoors and hang out outdoors tend to engage in greater physical activity as youth and later as adults (CDCP, 2010).⁹
- When children and adolescents participate in the recommended level of physical activity, at least 60 minutes daily, multiple health benefits accrue. Student physical activity may help improve academic performance including academic achievement (e.g., grades, standardized test scores); academic behavior (e.g., on-task behavior, attendance); and factors that can positively influence academic achievement (e.g. concentration, attention, improved classroom behavior) (CDCP, 2010).

⁶ Lieberman, Gerald A.; and Linda L. Hoody. “Closing the Achievement Gap: Using the Environment as an Integrating Context for Learning.” SEER: Poway, CA, 1998.

⁷ Chawla, Louise, and Myriam Escalante. Student Gains From Place-Based Education. University of Colorado at Denver and Health Sciences Center. 2007.

⁸ Rickinson, M., Dillon, J., Teamey, K., Morris, M., Choi, M. Y., Sanders, D., et al. (2004). *A review of research on outdoor learning*. Shrewsbury, UK: Field Studies Council. http://www.field-studies-council.org/documents/general/NFER/A_review_of_research_on_outdoor_learning.pdf

⁹ CDCP - Centers for Disease Control and Prevention. (2010). *The association between school based physical activity, including physical education, and academic performance*. Atlanta, GA: U.S. Department of Health and Human Services. http://www.cdc.gov/healthyyouth/health_and_academics/pdf/pa-pe_paper.pdf

Benefits to Lifestyle

- If children grow up interacting with nature, they are more likely to develop a conservation ethic, volunteer, recycle, participate in outdoor recreation as an adult, and work in natural resources-related professions.¹⁰
- Flowers (2007) found that participants of a Hooked on Fishing (HOF) program, a place-based conservation education program in Montana, had a positive change for knowledge outcomes (knowledge about fish, aquatic habitats, and associated natural resources), and skills to use when fishing and recreating in the outdoors (i.e., fish identification, handling, cleaning, release, and equipment use).
- Research shows that outdoor recreation programs and outdoor educator efforts can influence perceived development of life effectiveness skills among adolescent outdoor participants. Allen-Craig & Miller's (2007) results indicate that life effectiveness skills after a 5-day camp improved significantly from Pretest to Posttest. Enhanced life effectiveness skills may enhance healthy lifestyles.
- Meaningful engagement with nature as a child has a direct correlation with involvement in environmental issues in the future which is of great interest as communities look for the next generation of environmental leaders and activists.¹¹
- The Leisure Trends index implies that people who participate in outdoor activities tend to be happier than those who do not (see <http://www.leisuretrends.com/>). Implications are that active living may lead to a healthier lifestyle (CDCP, 2010; Children and Nature www.childrenandnature.org/; National Recreation and Park Association www.nrpa.org; USDHHS, 2002).¹²
- There is clear evidence that those who are active in their school years are more active as adults as well as in high calorie burning activities.¹³
- The most important forms of participation in outdoor recreation are those that become routine and regular, part of one's lifestyle. The greatest health benefits are associated with close-to-home outdoor recreation. Proximity, in other words, is a critical variable determining rates of participation, and this should serve as a wake-up call for public officials and urban planners to ensure that parks and open space are woven into a community's fabric, an essential ingredient in community livability. Until recently, there was not a recognized base of rigorous scientific research linking parks, outdoor activities, and recreation to better health outcomes. Consequently, the words 'recreation' and 'outdoor resources' provided little traction or political salience in setting priorities for improving health. The link between lack of physical activity and obesity has now

¹⁰ Chawla, Louise, and Myriam Escalante. Student Gains From Place-Based Education. University of Colorado at Denver and Health Sciences Center. 2007.

¹¹ Charles, C., Louv, R., Bodner, L., & Guns, B. (2008). *Children and nature 2008: A report on the movement to reconnect children to the natural world* Sante Fe, NM: Children and Nature Network. <http://www.childrenandnature.org/downloads/CNMovement.pdf>

¹² USDHHS (2002). Physical activity and fitness: Improving health, fitness, and quality of life through daily physical activity. *Prevention Report*, U.S. Department of Health and Human Services, 16(4) [From <http://odphp.osophs.dhhs.gov/pubs/prevrpt/02Volume16/Iss4Vol16.pdf>]

¹³ Outdoor Recreation Participation Topline Report, 2010
<http://www.outdoorfoundation.org/pdf/ResearchParticipation2010Topline.pdf>

been documented and provides a compelling case, during the ongoing national debate on health care reform, for promoting greater outdoor activity as a cost-effective, preventive approach to better health (*Great Outdoors America: The Report of the Outdoor Resources Review Group*, July 2009).¹⁴

Hunting and Fishing Participation

- For hunting participation in general, the most important opportunities for youth and parents in a hunting education program are opportunities to learn how to hunt and find game with others, to learn from an experienced hunter (mentorship), and to apply what was learned in the hunter education course. Learning how to shoot was the most important to youth while learning about guns and safety was for adults. More than 78% of the youth who had participated in a hunter education program in Massachusetts reported deer hunting after the course while 86% went target shooting (Zwick et al., 2006).¹⁵
- Active boaters and anglers vs. nonparticipants who had higher levels of ownership and personal responsibility for the environment are more likely to exhibit lifestyle and active stewardship behaviors (McMullin et al., 2007). Research continues to support that outdoor recreation participants (i.e., anglers and boaters) are more likely to participate in stewardship tasks that protect their recreational resources than they are to protect the environment in general (Cottrell & Graefe, 1997; Cottrell, 2003a, 2003b).
- According to Schroeder, Fulton et al., (2008, p. 13) higher appreciation, affiliation, and health motivations, greater limitations related to cost, and being a married male or married female positively predicted intended fishing participation in the next year, while age, discrimination, and discomfort outdoors were negative predictors. The greater appreciation for fishing motivation and access constraints positively predicted whether fishing was a favorite activity, while discomfort was a negative predictor.” Further, “individuals who attribute multiple valued outcomes like appreciative, social, and health benefits to angling are those who intend to fish in the future. People who attribute more limited benefits from fishing might opt for hiking, bicycling, or other forms of outdoor recreation to efficiently deliver desired benefits” (p.13).
- A Roper (2002) study of ‘minority’ attitudes about and participation in fishing found that a key inducement to fishing would be “an invitation to fish from a child or friend.”
- Minority groups continue to consistently fish less than Anglos nationally; however projections indicate that the greatest percentage increase in participation will be among these groups due to population increases (see Murdock et al. (1992) in Hunt & Ditton, 2002; Pullis, 2000).

¹⁴ Great Outdoors America: The Report of the Outdoor Resources Review Group, July 2009, http://www.orrgroup.org/documents/July2009_Great-Outdoors-America-report.pdf

¹⁵ Zwick, R., Flaherty, J., Solan, D., Tisa, M., & Langlois, S. (2005). Perceived opportunities and constraints on participation in a Massachusetts youth hunt. http://www.fs.fed.us/ne/newtown_square/publications/technical_reports/pdfs/2006/341%20papers/zwick341.pdf

Discussion

Clearly, outdoor activities have been shown to have a positive impact on *self*, and *others* and presumably on the *environment* in a general context. The benefits of outdoor skills education are noted across a diversity of programs that utilize such activities (e.g. recreation, leisure and sport, education, health and therapy), in the wide array of outdoor environments in which they take place, from urban nature parks to pristine wilderness. However, this is more difficult to pinpoint specifically to hunting and fishing participation, recruitment and retention. The most effective outdoor skill programs tend to be in structured programs: that are of longer duration; that are culturally appropriate; and where the effects appear to increase further over time.¹⁶ Some of the research challenges to show direct benefits of hunting and fishing education programs are the lack of longitudinal research beyond participation studies. Participation overall will likely continue to decrease due to population shifts to urban environments, increases in minority groups that tend not to participate in fishing and hunting, aging society, further habitat fragmentation and access to places to hunt more specifically, climate change and others. The good news is that overall Americans seem to have returned to nature in 2008 with increases in participation like backpacking, mountain biking and trail running that showed double-digit increases in participation, and hiking and camping with 9 percent and 7 percent increases, respectively.¹⁷ In addition, interest in and the popularity of fishing is still high on the list with 17% of American 6 years or older participating in freshwater, saltwater or fly fishing in 2008 representing the number one gateway activity by rate of participation and third by frequency of participation (number of outings).¹⁸ Freshwater fishing participation had a slight increase in 2009 over 2008 with core outdoor activity participation rates increased overall due to the economic downturn.¹⁹ Although hunting participation decreased overall, bow and rifle hunting participation increased. In a time of economic crisis, people tend to recreate closer to home, participate more in outdoor activities, spend less on equipment, and engage in activities that can be done in one day to keep costs down and fit busy schedules.

The prevalent indicators of recruitment and retention for hunting and fishing are structured programs, mentorship, culturally appropriate messaging and communication, outcomes oriented programs connected to attitude shifts (dominant/utilitarian value to caring/mutualism/animals have rights) and an environmental ethic, accessible and convenient as a means to overcome the constraints to hunting and fishing. Familial context and early life experiences will always be key indicators of lifelong retention. There are many examples of successful hunting and fishing programs at the international, national, state and local level (see list of successful strategies) and based on anecdotal observations and short term evaluation and monitoring do show marked participation increases with evidence-based benefits.²⁰

¹⁶ Dickson, T.J. Gray, T. & Mann, K. (2008). Australian Outdoor Adventure Activity Benefits Catalogue, University of Canberra, Australia,

<http://www.oric.org.au/IndustryNews/OutdoorActivityBenefitsCatalogueFinal270808.pdf>

¹⁷ Cordell, H.K., Betz, C.J. & Green, G.T. (2008). Nature-based outdoor recreation trends and wilderness. *International Journal of Wilderness*, 14(2), 7-13.

¹⁸ Outdoor Recreation Participation Report 2009

<http://www.outdoorfoundation.org/pdf/ResearchParticipation2009.pdf>

¹⁹ Outdoor Recreation Participation Topline Report, 2010

<http://www.outdoorfoundation.org/pdf/ResearchParticipation2010Topline.pdf>

²⁰ Dickson et al., (2008). Australian Outdoor Adventure Activity Benefits Catalogue

Overall, the literature implies the need to adopt a broader based conception of health from a holistic ecological perspective that moves beyond human physical and mental health to one that includes familial, communal, national, international, and global ecological health.²¹ Active living is crucial to healthy lifestyles and leads to potentially greater participation in fishing and hunting.

Conclusions

Several questions were considered while conducting this literature review:

- *Which programs or types provide a positive impact to healthy lifestyles and learning?*

Those programs that are well-structured outcomes oriented, provide mentorship / role models, address culturally appropriate messaging and communication for the appropriate target audiences (minority / ethnic groups versus Anglos), link to expectations and attitudes, address barriers and constraints to participation such as access, time limitations, and costs all in the context of a more holistic approach to conservation education will be more likely to contribute to healthy lifestyles and learning.

- *What is the connection between – the various programs and AFWA priorities – and does the research/documentation allude to recommendation of priorities for AFWA?*

Much of the research on outdoor skills education programs provide information that links naturally to the various programs of AFWA member agencies and priorities. A list, by no means exhaustive or all inclusive is given of both successful strategies as well as recommendations for what agencies can do and/or research considerations.

- *Is there a tendency to align hunting, fishing, shooting to make / increase newly recruited enthusiasts for these activities?*

In essence, do hunting and fishing education programs enhance participation across the lifespan as well as recruitment and retention? This was perhaps the most challenging question to address due to the limited longitudinal research or program specific (1st Cast Program with Trout Unlimited) research. Clearly, parental and familial supports of fishing or hunting at a young age are key indicators of likely participation in fishing and hunting. Only a few studies (Backman & Wright, 1993; Duda et al., 2002; Enck et al., 2000; Leonard, 2007; Schroeder, Fulton et al., 2008; Zwick et al., 2006) were found that could directly address this issue beyond the mere participation rate studies. Attitudes and beliefs are important to assess to understand the social-psychological indicators of recruitment and retention. The constraints literature among hunting and fishing participants (Miller & Vaske, 2002) contribute greatly to this understanding. Challenges posed by societal changes and the shifting wildlife value orientations posed by Manfredro et al. (2009) and others suggest the need for more holistic approaches to fishing and hunter education programs in particular. Several programs that provide anecdotal evidence of enhanced recruitment and retention are highlighted under the successful strategies section that follows. Only a few of these programs though have gone through the rigor of

²¹ Dustin, D.L., Bricker, K.S. & Schwab, K.A. (2010). People and Nature: Toward an Ecological Model of Health Promotion. *Leisure Sciences*, 32(1), 3-4.

monitoring and evaluation (e.g., *Hooked on Fishing by Flowers*, 2007; Youth hunts in Massachusetts, Zwick et al, 2006; First Cast Program / Trout Unlimited, Blair, 2007); thus much of the evidence remains anecdotal (e.g., Arkansas Game and Fish Commission's Family and Community Fishing Program, Racey et al, 2008) calling for the need for more longitudinal research such as that of Dr. Brett Bruyere at Colorado State University (see <http://warnercnr.colostate.edu/~bruyere/>).

- *What are the impacts of outdoor skills education programs?*

This question was addressed through the majority of the literature reviewed – although with more indirect results of the impacts and or benefits. The need exists to conduct more longitudinal research of the successful programs that exist that provide anecdotal evidence of recruitment and retention in fishing programs.

- *Which programs lead to 1st time participation and retention? – is it the activity oriented or broader based programs such as camping and outdoor skills.*

The literature suggests that the more holistic / ecologically oriented approach to outdoor skills education will enhance recruitment and retention (Henderson & Bialeschki, 2005; Neill, 1997; Riley, 1985; Roper Starch Worldwide, 2002; Schroeder, Nemeth, Sigurdson, & Walsh, 2008); although, the skills orientation (e.g., learning how to shoot, target practice, etc.) are important components of the overall educational program as noted by Zwick et al. (2006). Understanding higher appreciation, affiliation, and health motivations and the barriers (access, cost, time constraints) to participation with the associated demographics (minority versus Anglo) will lead to a better understanding of indicators of recruitment and retention.

Successful Strategies

There are many examples of best practice programs that illustrate a more integrated holistic approach to outdoor skills education and encouraging a connection to the outdoors. The following provide just a few of those examples that stood out from the review of literature conducted.

- Arkansas Game and Fish Commission's Family and Community Fishing Program were developed in 2002 to enhance and/or create fishing opportunities (destinations) in urban environments so that excellent fishing opportunities are available. Starting with 10 stockable locations, the program grew to 36 locations in 2007. Fishing derbies and clinics are provided free offering opportunities for people to fish with families and friends in convenient locations (Racey et al., 2008).
- The 10th edition of the *Best Practices Workbook: For Boating, Fishing and Aquatic Resources Stewardship Education*, developed by The Recreational Boating and Fishing Foundation, provides a detailed integrated approach for program planning, development and implementation, professional development, program evaluation and educational program research about teaching boating, fishing and stewardship of aquatic resources. It provides straightforward criteria and tools for educators based on research and testing (Best Practices Workbook, 2010).
- The Community Fisheries Program (CFP), Utah Division of Wildlife Resources, has

graduated 10,000 youth over a 7-year period. The program was created to provide fishing opportunities close to urban centers and recruit youth to fishing. The CFP illustrates successful partnerships between city and county governments (Penne & Cushing, 2008).

- The Alabama Division of Wildlife and Freshwater Fisheries offers youth hunts for dove, turkey, and squirrel. Of the youth that participated in these hunts, Alabama reports one-third of them were first-time hunters. Encouraged by this success, Alabama is moving forward with other youth-focused hunts for deer and waterfowl (Retrieved from AFWA <http://www.fishwildlife.org/about.html>)
- The Arizona Game and Fish Department initiated a Scholastic Clay Target program in 2004 to target young shooter recruitment. After the first year, this program has become the second-largest scholastic clay shooting program in the country (Retrieved from AFWA <http://www.fishwildlife.org/about.html>).
- Project Nature Connect is a web based environmental education program for elementary through advance degree training. The programs claim to fame is how to get people outdoors responsibly. The program has been in existence since 1985 (Thomas, 2005) which is an indicator of its longer term success.
- *Becoming an Outdoors Woman* is a non-profit, educational program offering hands-on workshops to adult women. See <http://www.uwsp.edu/cnr/bow/> (Houghton, et al., 2001).
- The California Department of Fish and Game's *Fishing Passport Program* challenges participants to fish their way around California for 150 fish and shellfish species. Similar to a passport, participants receive a special stamp for each catch they make. See <http://www.dfg.ca.gov/fishingpassport/>
- Structuring a Learning Experience is an article by Paul Nicolazzo that depicts the various stages of how to structure a learning experience for outdoor skills education. See OutdoorEd.com - The Outdoor Education Professional's Resource.
- The Children and Nature 2009 report on the Movement to Reconnect Children to the Natural World (pp. 43-49) provides a lengthy bullet list of what businesses, conservation groups, educators, governments, health care providers, and legal professions could do to connect children to nature. The ideas are numerous with none depicted as the best way, yet listing approaches for different settings, some tested and many not. See <http://www.childrenandnature.org/downloads/CNNMovement2009.pdf>
- Boater education courses tend to enhance appropriate safety behavior as well as a more frequent participation in safety practice (wearing a lifejacket, checking equipment, etc) (Responsive Management, 2010). http://nasbla.org/files/NASBLA_2008_Phase_II_Survey_Report_Final-08-2010.pdf).
- The Colorado Kids Outdoor Initiative was launched in May 2009 to raise awareness and learn more about the alarming disconnect between youth and the outdoors. Between May and September 2009, over 600 stakeholders convened at eleven sites throughout the state. Representatives from a variety of sectors including public health, businesses, conservation organizations, youth groups, land management agencies, local governments, and education attended the public forums. This report outlines benefits and strategies to connect kids to the outdoors. A list of strategies by state is provided (see Appendix C)

http://www.aspenpitkin.com/Portals/0/docs/county/OpenSpace/publicpackets/LtGov's_CKO_Initiative_Report.pdf.

Recommendations

Recommendations to enhance a more holistic approach for outdoor skills programs drawn from the literature review are given below:

- In 1995, a report was published for the national Wildlife Federation that outlined strategies for encouraging outdoor ethics. 300 references are provided that cover approaches to outdoor ethics education for public awareness campaigns and codes of ethics; user education courses; interactive methods; Project Wild; use of role models; mentoring; community clubs; and peer teaching (Matthews & Riley, 1995 – see <http://www.eric.ed.gov/PDFS/ED401097.pdf>).
- Outdoor skills education efforts should increase the sense of personal ownership of natural resources. This can be done by personal and political involvement in conservation causes (McMullin et al., 2007).
- Although there is some link between actual participation in outdoor activities and some stewardship effort, conservation educators and resource managers should not continue to just rely on that fallacy (McMullin et al., 2007) and that other factors play a role for recruitment and retention over a longer time frame.
- Volunteer programs such as the Partners for Native Plants (PNP) group should focus on volunteer expectations to enhance volunteer retention. For instance in the PNP project in Denver, those volunteers who experienced direct benefits continued their engagement with the PNP project; those who did not lessened or completely ended their involvement (DiEnno, 2009).
- To be successful in volunteer conservation projects, project managers should tailor outdoor projects to explain their environmental significance; such efforts tend to retain volunteers (see Bruyere & Rappe, 2007 in DiEnno, 2009).
- Research results suggest that appreciative, social, and health motivations are associated with intended participation in fishing, so managers could emphasize these benefits to encourage participation (Shroeder, Fulton et al., 2008).
- Results of a study of anglers in urban environments indicate that people who perceive higher access and cost constraints report greater intentions to fish in the future; managers could market fishing as a low-cost retreat from negative aspects of the urban environment (Schroeder, Fulton et al., 2008). In addition to stocking fish and providing fishing docks, urban fisheries managers might focus on structural constraints to angling (Miller & Vaske, 2003). Shroeder, Fulton et al found that potential discomfort and discrimination limited intended participation in fishing. To compensate, urban fisheries managers could offer comfortable structures for angling. Managers might also focus on regulations, access, license fees, and agency trust to increase urban angling participation.
- Mangun et al. (2007) cited in Schroeder, Fulton et al. (2008) assessed how stakeholder perceptions influenced hunter participation and described three areas of perceived situational constraints to hunting: quality of experience, regulatory environment, and trust.

Similar factors likely affect urban fishing participation. Programs might work to adjust aspects of the regulatory environment (e.g., license fees and vendors). Free fishing days, reduced-price licenses exclusively for urban angling, and more convenient license vendors might increase participation. Programs affiliated with local community organizations or led by diverse community members might increase agency trust and subsequently increase urban angling participation. Public or private fishing opportunities that provide equipment and do not require licenses might also increase interest and participation in angling among urban populations.

- Wildlife agencies must interact with a broader range of society versus sportsmen only to examine anti-activity attitudes and beliefs to help formulate programs to address or modify negative attitudes (Backman & Wright, 1993).
- Support for use of green space and natural areas as safe havens for nature experience is necessary to encourage adult acceptance of child play in more wild places (ILI, 2010).
- Parks and Recreation programs have golden opportunities to advance healthy student lifestyles in after-school settings; complementing school efforts can engage kids in healthy lifestyle choices. For instance, Park and Recreation departments could encourage and promote the afterschool programs they offer to communities. Linkages with such programs as the Lights on Afterschool with the Afterschool Alliance, a non-profit organization dedicated to ensuring that all children have access to high quality and affordable after-school programs (Hobbs-Viniuan, 2006; NRPA, 2008) is suggested. These efforts highlight the importance of networking between agencies to share resources and expertise.
- Resource managers should simplify communications, use new media mechanisms, mediate discriminatory law enforcement, and develop innovative outdoor skills programs to address the unique barriers to outdoor activities faced by minorities (Schroeder et al., 2008).
- As it pertains to hunting and fishing participation, well structured fishing and hunter education programs that capture the essence of personal growth and facilitate the numerous benefits or awareness of may lead to increased recruitment and retention (AIR, 2005).
- In order for outdoor education to make a good contribution to students overall education and healthy lifestyles, a program must be structured to include continuous and progressive outdoor education throughout the educational experience (Woodhouse, 1987).
- A Roper (2002) study of ‘minority’ attitudes about and participation in fishing found that a key inducement to fishing would be “an invitation to fish from a child or friend.”

Future Research

As it pertains to further research, the following highlights were drawn from the literature review.

- It is important to examine changing demographics (community of color). Further questions to explore are: 1) how to program and attract more minorities to outdoor recreation? And 2) how to increase family unity – among Caucasians via outdoor recreation participation?

- Future research should address how household dynamics (e.g., changing household size and family structure) mediate the relationship between outdoor recreation and environmental views.
- A study of people who used to fish and no longer do so is recommended. A similar approach should be applied to outdoor recreation participation in general.
- There is a distinct shortage of studies investigating the potential of outdoor education to enhance academic achievement.
- An area awaiting further investigation is the effect that outdoor education programs can have on school climate and student culture.
- Comparative studies of outcomes from different outdoor education programs are rare, particularly for school student programs.
- Focus on how anti-activity (anti-hunting) attitudes form (Backman & Wright, 1993).
- Evidence of programs that influence participation is difficult to document; there is a need to conduct more longitudinal studies of program participants to examine participation patterns.
 - Which programs lead to 1st time participation and retention? – is it the activity oriented or broader based such as camping and outdoor skills.

SECTION I. INTRODUCTION

Current demographic trends indicate that although the U.S. population is increasing, hunting and fishing participation is declining over time (Floyd & Lee, 2002; Manfredo, Teel, & Bright, 2003; Miller & Vaske, 2003; Zwick et al., 2005). Because of the transient nature of society, increased demands on leisure time, changing ideas in our society about the kinds of recreational options among which our youth should choose, and other factors (child obesity and disconnect to nature), these trends may lead to the end of hunting as we know it today. This may have negative impacts on the world's most successful wildlife management programs, which rely on significant participation and financial support from hunters and fishermen. It could have negative economic impacts on rural America as well (Wentz & Seng, 2000).

In response to these issues, The *North American Conservation Education Strategy* (CE Strategy) was designed by the Association of Fish and Wildlife Agencies (AFWA) to unify and strengthen conservation education efforts of AFWA member agencies and partners in a manner that effectively advances the Association's Strategic Plan and the North American Model of Fish and Wildlife Conservation. AFWA's vision for conservation education in the new millennium is intended to strengthen formal and nonformal educational efforts to progress beyond the recruitment and retention of citizens to merely participate in outdoor recreation endeavors (Flowers, 2009).

Increasingly, schools are including outdoor skills in their physical education classes, or otherwise incorporating outdoor activity into the school day. The National Archery in the Schools program (NASP) continues to grow into thousands of schools across the United States. In New Hampshire, PE standards focus on life skills. In the winter, elementary schools are required to take one-half day each Friday for students to be outdoors engaging in winter activities such as snowshoeing, skiing, or other winter sport. In Minnesota, the legislature passed legislation requiring the Department of Natural Resources to develop an outdoor education report in conjunction with the Department of Education. AFWA seeks documentation in the literature and media of positive impacts of these and similar programs.²²

Research into the benefits of outdoor skills education (see Appendix A for overview of benefits) highlights the valuable contribution they make to personal health and wellbeing. Outdoor skills education provide opportunities for the connection of individuals with nature (the natural environment), direct connection with other people (interpersonal), and with themselves (personal). This report draws on research from adult learning, education (i.e., adventure, boating, conservation, experiential, hunting, fishing, outdoor, physical and wilderness), health, leisure, recreation, sport, therapy, and at-risk-youth to highlight the evidence of the positive contributions of outdoor skills education on hunting, fishing and other outdoor activities.

²² Paragraph taken from Request for Services: Literature Review and Report – Benefits of Outdoor Skills to Health, Learning and Lifestyle, prepared by AFWA, April 2010

A. Purpose of Literature Review

The purpose of this review of literature was to determine the extent to which positive impacts of outdoor skills education and wildlife related outdoor education are documented with respect to health, lifestyle and student learning. Information that documents the extent to which students who participate in outdoor skills education go on to become hunters and anglers was examined as well.

Objectives

Three objectives were outlined in the scope of work for this literature review:

Objective 1. To identify sources, including peer reviewed journal publications, industry and trade studies, and media articles that document/report a positive impact of outdoor skills to health, lifestyle and learning.

Objective 1 was achieved by developing a comprehensive list and collection of sources of impacts of outdoor skills on health, lifestyle and learning in America. Documents include industry reports (i.e., Outdoor Industry Foundation reports, U.S Fish and Wildlife Service, Private and Public Land Use study reports, National Survey of Fishing, Hunting, and Wildlife-Associated Recreation reports, etc.), academic peer-reviewed journals, and popular media sites online. An initial phone call with AFWA was made to obtain an initial list of sources and materials available in their archives and to refine key words for a literature search. Colorado State University library was used with its vast linkage with libraries across the USA including the interlibrary loan service and the Library of Congress. Google Scholar search engine was used as well.

Objective 2. Identify sources, including peer reviewed journal publications, industry and trade studies, and media articles that document/report a connection between outdoor skills education and engagement in wildlife-related recreation such as hunting and fishing.

Objective 2 was achieved through an examination of a variety of publications that document/report a connection between outdoor skills education and engagement in wildlife-related recreation such as hunting and fishing in America. The same steps outlined for objective 1 were employed for this task to obtain the literature necessary for the analysis.

Objective 3. Content analysis of documents highlighting the positive benefits of outdoor skill education to healthy lifestyles and participation in hunting and fishing.

Objective 3 was addressed through an analysis and interpretation of information gathered for objectives 1 and 2 based on the positive impact and engagement in outdoor activities in general and hunting and fishing in particular.

Some questions posed by the Conservation Education Strategy committee for this review were:

- Which programs or types provide a positive impact to healthy lifestyles and learning?
- What is the connection between – the various programs and AFWA priorities – and does the research/documentation allude to recommendation of priorities for AFWA?

- Is there a tendency to align hunting, fishing, shooting to make / increase newly recruited enthusiasts for these activities?
- What are the impacts of outdoor skills education programs?
- Which programs lead to 1st time participation and retention? – is it the activity oriented or broader based programs such as camping and outdoor skills.

B. Outcomes

This report identifies and categorizes the significant literature in the US and other countries (i.e., Australia, Germany, New Zealand, Sweden, The Netherlands, United Kingdom) around the world relevant to outdoor skills education in the context of health, lifestyle, and learning. An MS Excel spreadsheet includes references and abstracts for several of the documents reviewed and additional literature related to outdoor skills, hunting and fishing participation that were related to or supported the primary literature. Hyperlinks for those documents available for the public online were provided for easy access when possible.

SECTION II. Methods

Cottrell and Associates Environmental Consulting (CAEC) was contracted in May 2010 to conduct a literature review of the *Benefits of Outdoor Skills to Health, Learning and Lifestyle*. A kickoff meeting with the Conservation Education Strategy Outdoor Skills Working Group was held May 28, 2010 to discuss the terms of reference, identify priority areas (e.g., hunting and fishing participation trends), assess overall committee project interests, and establish key terms to use for the literature review.

A project management site was set up on BASECAMP, web-based project management site online, to facilitate communication and collaboration between the Conservation Education Strategy working group and CAEC for the 3-month duration of the project. Monthly progress updates were provided at the end of June, July and August. A draft report was submitted for working group review in mid-September to allow revisions made prior to September 26, 2010.

A. Literature Search

For this review, relevant research articles and reports were identified through a search of electronic databases via the Colorado State University library databases and Google Scholar online search engine using *outdoor skills education, health, learning and lifestyle* as the initial search terms in the context of conservation education. Additional terms were added including hunting/ fishing participation, healthy lifestyles, outdoor recreation, adventure education, active living, risk, leisure constraints, etc. Research from adult learning, education (i.e., adventure, boating, conservation, experiential, hunting, fishing, outdoor, physical and wilderness), health, leisure, recreation, sport, therapy, and at-risk-youth were examined to highlight the evidence of the positive contributions of outdoor skills education on hunting, fishing and other outdoor activity participation. Documents include industry reports (i.e., Outdoor Industry Foundation reports, U.S Fish and Wildlife Service Private and Public Land Use study reports, National Survey of Fishing, Hunting, and Wildlife-Associated Recreation reports, etc), academic peer-reviewed journals, doctoral dissertations and Masters' theses, NGOs, and popular media sites online.

The search yielded a total of 100+ documents that were examined to determine their match with the inclusion criteria (key terms and date of publication mostly mid-1990s to 2010). Ninety-nine documents met the inclusion criteria and were reviewed and abstracted for this synthesis.

Inclusion criteria

A focus on literature in the new millennium was sought with some documents published in the 90s and a few in the 80s when necessary to provide documentation of original theory (*leisure constraints* - Crawford et al. 1991 in Zwick et al., 2006) and trends (*active living* - Henderson & Bialeschki, 2005) in the research literature. There are many critics of outdoor skills education related research pre-1995 and there seems to be a substantial shift in the robustness and trans-disciplinary nature of the more recent research literature (Neill, 1997).

Key terms

The initial key terms were health, learning, lifestyle, and outdoor skills.

Health refers to physical, social aspect, and mental well being demonstrated in *lifestyles*.

Lifestyle – refers to regular outdoor activity, centrality to lifestyle (memberships to organizations, magazines, etc), donations, longevity and quality of life / healthy living.

Learning – refers to positive enhanced learning, skill level increase, additional training, increase compliance with rules, safety, accident reduction

Outdoor skills are defined as wildlife-related outdoor recreation that is not team sports, including but not limited to the following:

- Archery
- Backpacking, woodcraft
- Boating, canoeing, kayaking
- Camping
- Fishing
- Hiking
- Hunting
- Map and compass, orienteering
- Snowshoeing
- Tracking
- Wildlife identification
- Wildlife viewing/birdwatching
- Winter survival

As the search for relevant literature progressed, additional key terms were added to the search:

Adult learning, constraints, education (i.e., adventure, boating, conservation, experiential, hunting, fishing, outdoor, physical and wilderness), leisure, recreation, sport, wilderness therapy, at-risk-youth, licensing, retention and recruitment, activity specific participation trends, minorities, fear and risk in the woods.

B. Limitations

Project limitations are posed within the scope of the literature review itself. The breadth of literature available across the various disciplines (outdoor education, adventure education, conservation education, leisure, physical education) is tremendous, thus making it difficult to determine when and where to stop reviewing additional literature. Therefore, this literature review cannot be considered exhaustive. Secondly, direct cause effect relationships of outdoor skills education on activity participation (recruitment and retention), healthy lifestyles and life long learning, responsible environmental behavior and stewardship are difficult to determine due to the lack of longitudinal research. Much of the research pre 1990s of outdoor education were case / site specific with small numbers which could not be generalized to the general population. In addition, much of the literature remains anecdotal based on subjective / qualitative assessments which cannot be generalized as well. Yet, research efforts have improved in the late 1990s up to the present with advances in methods used and the robustness of sampling methods overall; therefore, despite the limitations, indirect linkages can be to the benefits derived from outdoor skills education on health, lifestyle and learning.

SECTION III. Findings

The review examines findings of 100+ documents representing research from adult learning, education (i.e., adventure, boating, conservation, experiential, hunting, fishing, outdoor, physical and wilderness), health, leisure, recreation, sport, therapy, and at-risk-youth to highlight evidence of positive contributions of outdoor skills education on hunting, fishing and other outdoor activities. Several sub-themes (fear of the woods) were determined based on the review of literature to highlight the impacts of outdoor skills on health, learning and lifestyle.

The sub-themes used to structure the presentation of review summaries are as follows:

- Fear of the woods
- Healthy lifestyles
- Minorities and outdoor skills education as a tool to increase outdoor recreation participation and other perceived benefits
- Outdoor education possibilities to increase environmental stewardship
- Outdoor experience for teens has self-reported life-changing results
- Outdoor recreation and health benefits
- Outdoor recreation influence on participation and attitudes
 - Constraints to hunting and fishing participation
 - Hunting and fishing participation
- Program provision
- Wildlife Value Orientations

For each of the sub-themes, a brief summary of the literature is given followed by the works cited and suggested additional readings that may or may not have been cited, yet are key readings of the literature review. There is some overlap of literature referenced per key theme area. Meanwhile, the complete list of works cited and other sources is given in alphabetical order in the Bibliography section followed by additional sources, industry reports / websites and theses / dissertations.

A. Fear of the woods

Charles, Louv, Bodner and Guns (2008) report for the Children and Nature Network builds upon the inspiring book *Last child in the woods* (Louv, 2006) that seeks to save children from “nature-deficit disorder,” which they link to rising obesity levels, attention disorders and depression in young people. The movement to reconnect children to the natural world seeks to “help shape a society in which the public once again considers it to be normal and expected for children to be outside and playing in natural areas” (Charles et al., 2008, p. 21). The greatest barrier to achieving this is fear.

A recent study (February 2010) of American attitudes towards children’s experiences in nature assessed adult attitudes and beliefs surrounding parent support for children’s nature experiences. Adults generally believe in the importance of child outdoor experiences and claim they will support opportunities for children to experience nature. However, concern for children’s safety in wild places such as woods, creeks and ponds, or open spaces limit parental

willingness to allow their children to participate in unsupervised play or free exploration although they had these experiences as a youth. Since fears of risks to children are prevalent, attitude shifts are necessary with telling stories of positive experiences in nature as children.

The Children and Nature Network (C&NN) is a back to nature movement to reconnect children with the outdoors. The C&NN website (see <http://www.childrenandnature.org/>) provides updated literature, news bulletins, and research on information related to the connection of children and nature. C&NN website provides the most recent news and information about the children and nature movement, as well as up-to-date reporting on research, legislation, best practices, and a bibliography of related books and publications (C&NN, 2009). The following are books and materials taken from the website important to the scope of objectives 1 and 2 of this literature review.

Works cited:

- Charles, C., Louv, R., Bodner, L., & Guns, B. (2008). *Children and nature 2008: A report on the movement to reconnect children to the natural world* Sante Fe, NM: Children and Nature Network. [From <http://www.childrenandnature.org/downloads/CNMovement.pdf>]
- C&NN (2009). *Children and Nature 2009: A Report on the Movement to Reconnect Children to the Natural World*. Prepared by the Child and Nature Network and EcoAmerica, [From <http://www.childrenandnature.org/downloads/CNNMovement2009.pdf>]
- ILI. (2010). *American beliefs associated with encouraging children's nature experience opportunities Development and Application of the EC-NES Scale, Report for Children and Nature Network* by Institute for Learning Innovation(ILI), Edgewater, MD. [From http://www.childrenandnature.org/downloads/EC-NES_Final_Report_2010.pdf]

Key suggested readings:

- Building for Life: Designing and Understanding the Human-Nature Connection*, by Stephen R. Kellert. Washington, D.C.: Island Press, 2005.
- Children and Nature 2009: A Report on the Movement to Reconnect Children to the Natural World* (September 2009). <http://www.childrenandnature.org/downloads/CNNMovement2009.pdf>
- Coming Home: Community, Creativity and Consciousness*, by Cheryl Charles and Bob Samples. Fawnskin, CA: Personhood Press, 2004.
- Infants, Toddlers, and Families: A Framework for Support and Intervention*, by Martha Farrell Erickson and Karen Kurz-Riemer. New York: The Guilford Press, 1999.
- Last Child in the Woods: Saving Our Children from Nature-Deficit Disorder*, by Richard Louv. Chapel Hill: Algonquin, 2008, 2005.
- The Children & Nature Network Community Action Guide: Building the Children & Nature Movement from the Ground Up*.
- This Guide is a useful tool to help build the children and nature movement at the local and regional level. The Guide describes an action-oriented process to design and implement initiatives, and is based on models that work and lessons learned in other civic initiatives in the United States and Canada. Available for download at <http://www.childrenandnature.org>.
- Children & Nature Network Annotated Bibliographies of Research and Studies*
C&NN developed four sets of abstracts of premier research studies, with links to original research, focused on the growing gap between children and nature, and the increasing

scientific knowledge about the importance of nature experiences to healthy child development. Available for download at www.childrenandnature.org/research/

- Volume 1, February 2007, by Cheryl Charles
- Volume 2, June 2007, by Alicia Senauer
- Volume 3, September 2008, by Alicia Senauer
- Volume 4, September 2009, by Alicia Senauer Loge

Children & Nature Network Leadership Series

This new resource is launched by Dr. Martha Farrell Erickson's article, "Shared Nature Experiences as a Pathway to Strong Family Bonds," and Dr. Stephen Kellert's article, "Reflections on Children's Experience of Nature."

www.childrenandnature.org/downloads/CNN_LWS_Vol1_01.pdf

www.childrenandnature.org/downloads/CNN_LWS_Vol1_02.pdf

B. Healthy Lifestyles

The Leisure Trends index implies that people who participate in outdoor activities tend to be happier than those who do not (see <http://www.leisuretrends.com/>). Implications are that active living may lead to a healthier lifestyle (CDCP, 2010; Children and Nature www.childrenandnature.org/; National Recreation and Park Association www.nrpa.org; USDHHS, 2002). A segment of the literature reviewed in this project tends to support that claim.

Although leisure researchers have been studying active living for many years, the research has focused more on individual factors than social and environmental determinants that enable physical activity and health. Children who are more active outdoors and hang out outdoors tend to engage in greater physical activity as youth and later as adults (CDCP, 2010). Leisure, park, and recreation researchers need to contribute more to the active living discourse on a broader level than just the individual (Henderson & Bialeschki, 2005). Parks and Recreation programs have golden opportunities to advance healthy student lifestyles in after-school settings; complementing school efforts can engage kids in healthy lifestyle choices. For instance, Park and Recreation departments could encourage and promote the afterschool programs they offer to communities. Linkages with such programs as the Lights on Afterschool with the Afterschool Alliance, a non-profit organization dedicated to ensuring that all children have access to high quality and affordable after-school programs (Hobbs-Viniuan, 2006; NRPA, 2008) is recommended.

When children and adolescents participate in the recommended level of physical activity, at least 60 minutes daily, multiple health benefits accrue. Student physical activity may help improve academic performance including academic achievement (e.g., grades, standardized test scores); academic behavior (e.g., on-task behavior, attendance); and factors that can positively influence academic achievement (e.g. concentration, attention, improved classroom behavior) (CDCP, 2010).

Research shows that outdoor recreation programs and outdoor educator efforts can influence perceived development of life effectiveness skills among adolescent outdoor participants. Allen-Craig & Miller's (2007) results indicate that life effectiveness skills after a 5-day camp

improved significantly from Pretest to Posttest. Enhanced life effectiveness skills may enhance healthy lifestyles.

In a study to examine factors that motivate or constrain outdoor recreation (e.g., fishing) among urban and suburban dwellers in Minnesota, appreciation (i.e., enjoying nature and the outdoors) and health (i.e., stress reduction) were the two greatest motivators (Schroeder et al., 2008). Many studies imply that use and exposure to the outdoors and park-like settings through outdoor activities can improve moods, perceived wellness, and increase longevity. More specifically, access and use of local park and recreation opportunities (e.g., running, cycling, fitness programs) is associated with increased physical activity and such activities are associated with improved health aspects such as lower blood pressure and perceived physiological - psychological health (see review in NRPA, 2008).

The most important forms of participation in outdoor recreation are those that become routine and regular, part of one's lifestyle. The greatest health benefits are associated with close-to-home outdoor recreation. Proximity, in other words, is a critical variable determining rates of participation, and this should serve as a wake-up call for public officials and urban planners to ensure that parks and open space are woven into a community's fabric, an essential ingredient in community livability. Until recently, there was not a recognized base of rigorous scientific research linking parks, outdoor activities, and recreation to better health outcomes. Consequently, the words 'recreation' and 'outdoor resources' provided little traction or political salience in setting priorities for improving health. The link between lack of physical activity and obesity has now been documented and provides a compelling case, during the ongoing national debate on health care reform, for promoting greater outdoor activity as a cost-effective, preventive approach to better health. (*Great Outdoors America: The Report of the Outdoor Resources Review Group*, July 2009)

Works cited:

- Allen-Craig, S. & Miller, J. (2007). Can outdoor educators make a difference? The effect of outdoor educators on achieving program outcomes. *ACHPER Healthy Lifestyles Journal*, 54(2), 5-12. (Article 4)
- CDCP - Centers for Disease Control and Prevention. (2010). *The association between school based physical activity, including physical education, and academic performance*. Atlanta, GA: U.S. Department of Health and Human Services. [Retrieved August 1, 2010 from http://www.cdc.gov/healthyyouth/health_and_academics/pdf/pa-pe_paper.pdf]
- Henderson K. A. & Bialeschki M. D. (2005). Leisure and Active Lifestyles: Research Reflections, *Leisure Sciences*, 27, 355–365.
- Hobbs-Viniuan, M (2006). School Is Back in Session, *Parks and Recreation*. September, 14-17.
- NRPA (2008). Health Partnerships of Recreation and Park Organizations: Results from a Nationwide Study [From http://www.nrpa.org/uploadedFiles/Explore_Parks_and_Recreation/Research/Health%20Partnerships%20of%20Recreation%20Organizations.pdf]
- Great Outdoors America: The Report of the Outdoor Resources Review Group, July 2009, http://www.orrgroup.org/documents/July2009_Great-Outdoors-America-report.pdf

Schroeder, S.A., Nemeth, M.L., Sigurdson, R.E. & Walsh, R.J. (2008). Untangling the line: Constraints to fishing participation in communities with color. Urban and community fisheries programs: Development, management and evaluation. *American Fisheries Society Symposium*, 67, 97-112.

USDHHS (2002). Physical activity and fitness: Improving health, fitness, and quality of life through daily physical activity. *Prevention Report*, U.S. Department of Health and Human Services, 16(4) [From <http://odphp.osophs.dhhs.gov/pubs/prevrpt/02Volume16/Iss4Vol16.pdf>]

C. Minorities and outdoor skills education as a tool to increase outdoor recreation participation and other perceived benefits

Minority groups continue to consistently fish less than Anglos nationally; however projections indicate that the greatest percentage increase in participation will be among these groups due to population increases (see Murdock et al. (1992) in Hunt & Ditton, 2002; Pullis, 2000). Most Anglo males start fishing during their adolescent years, while most African-American and Mexican-American males start fishing as teenagers or later which implies a different way of being socialized into recreational fishing. Some leisure theorists' view socialization into leisure activities as occurring over a lifetime instead of being a refinement of activities learned as a youth (see Hunt & Ditton, 2002). Minority groups tend to fish more alone, along the shoreline, without access to a boat, and fish for a greater variety of fish. Minorities and ethnic groups perceive similar benefits of fishing and hunting as whites yet face uniquely different constraints (i.e., selective law enforcement, discriminatory behavior, language and safety concerns such as skill and swimming) than the former (Schroeder et al., 2008). Implications are for resource managers to simplify communications, use new media mechanisms, mediate discriminatory law enforcement, and develop innovative outdoor skills programs to address the unique barriers to outdoor activities faced by minorities.

Gender and race (i.e., white males) are consistent predictors of who buys fishing licenses (Floyd & Lee, 2002; Houghton et al., 2001). Minorities such as African-Americans, Hispanics and women are less likely to fish and hunt than the overall population (Outdoor Participation Report, 2009; Pullis, 2000). Interestingly, Hispanics spend more hunting and fishing than other minority groups while women spend the least no matter if their level of income increases. Minority groups cite school work as the reason they don't get out more than Anglo groups while Hispanics and nonparticipants cite lack of access to places to participate in outdoor activities as barriers more than other ethnicities (Outdoor Participation Report, 2009).

Resilience refers to an individual's capacity for maintenance, recovery or improvement in mental health following life challenges, successful adaptation following exposure to stressful life events and an individual's capacity for transformation and change (see review in Neill & Dias, 2001). Research shows that challenge in outdoor education programs enhance resilience if social support is high within the group environment (Neill, 2002) and this is especially important among minority groups (Duda et al., 1999; Dywer & Barro, 2000; Houghton et al., 2000). Results of the Becoming an Outdoors Woman program (<http://www.uwsp.edu/cnr/bow/>) indicates the importance of role models and creating culturally diverse inclusive materials for women and minority nature based pursuits (Houghton et al., 2000).

For hunting participation in general, the most important opportunities for youth and parents in a hunting education program are opportunities to learn how to hunt and find game with others, to learn from an experienced hunter (mentorship), and to apply what was learned in the hunter education course. Learning how to shoot was the most important to youth while learning about guns and safety was for adults. More than 78% of the youth who had participated in a hunter education program in Massachusetts reported deer hunting after the course while 86% went target shooting (Zwick et al., 2006).

Works cited and key readings:

- Duda et al., (1999). The future of fishing in United States: assessment of needs to increase sport fishing participation. Report of Responsive Management to the International Association of Fish and Wildlife Agencies. Harrisonburg, Virginia.
- Dwyer, J. F., & Barro, S.C. (2000). Outdoor recreation behaviors and preferences of urban racial/ethnic groups: An example from the Chicago area. Proceedings of the 2000 Northeastern Recreation Research Symposium. *USDA Forest Service General Technical Report Northeastern Forest Experimental Station, 276*, 159-164.
- Fedler, A. (2000). Participation in boating and fishing: a literature review. Report of Human Dimensions Consulting to the Recreational Boating and Fishing Foundation. Alexandria, Virginia.
- Floyd, M.F. & Lee, I. (2002). Who buys fishing and hunting licenses in Texas? Results from a statewide household survey, *Human Dimensions of Wildlife, 7*, 91–106.
- Houghton, J.E., Thomas, C.L., Goodman, L., et al. (2001). Bridging the race and gender divides in forest recreation and private forest management through the becoming an outdoors-woman example. *Proceedings of the Society of American Foresters, 2001 national Convention*, 398-403. From http://nrs.fs.fed.us/pubs/gtr/gtr_ne302/gtr_ne302_102.pdf
- Hunt K.M., & Ditton, R.B. (2001) Perceived benefits of recreational fishing to Hispanic-American and Anglo Anglers. *Human Dimensions of Wildlife, 6*, 153-172.
- Hunt, K.M.1 & Ditton, R.B. (2002). Freshwater fishing participation patterns of racial and ethnic groups in Texas, *North American Journal of Fisheries Management 22*, 52–65.
- Neill, J. T., & Dias, K. L. (2001). Adventure Education and Resilience: The Double-Edged Sword. *Journal of Adventure Education and Outdoor Learning, 1*(2), 35-42. [Retrieved from <http://wilderdom.com/JamesNeill/JamesNeillpublicationsPopular.htm>].
- Neill, J.T. (2002). Meta-analytic Research on the Outcomes of Outdoor Education - Paper presented to 6th Biennial Coalition for Education in the Outdoors Research Symposium, Bradford Woods, IN, 2002, [Retrieved from <http://wilderdom.com/JamesNeill/JamesNeillpublicationsPopular.htm>].
- Pullis, G. (2000). Participation and expenditure patterns of African-American, Hispanic, and women hunters and anglers: Addendum to the 1996 National Survey of Fishing, Hunting and Wildlife-Associated Recreation (Report 96-6). Washington, DC: U. S. Fish and Wildlife Service, Division of Federal Aid, [From http://www.rbff.org/uploads/Research_section/USFWS_report.pdf]
- Riley, C.K. (1985). Missouri outdoor recreation skills program. Hunter education and more. *Transactions of the North American Wildlife and Natural Resources Conference*, p. 109-112.
- Roper Starch Worldwide (2002). Minority anglers and boaters: attitudes and participation in fishing, boating and resource stewardship (No. CNT547). Report to the Recreational Boating and Fishing Foundation. Roper Starch Worldwide, New York.
- Schroeder, S.A., Nemeth, M.L., Sigurdson, R.E. & Walsh, R.J. (2008). Untangling the line: Constraints to fishing participation in communities with color. Urban and community fisheries programs: Development, management and evaluation. *American Fisheries Society Symposium, 67*, 97-112.

- Toth, J.F. & Brown, R.B. (1997). Racial and gender meanings of why people participate in recreational fishing. *Leisure Sciences, 19*, 129-146.
- Zwick, R., Flaherty, J., Solan, D., Tisa, M., & Langlois, S. (2005). Perceived opportunities and constraints on participation in a Massachusetts youth hunt. *Proceedings of the 2005 Northeastern Recreation Research Symposium GTR-NE-341*, 254-261. [From http://www.fs.fed.us/ne/newtown_square/publications/technical_reports/pdfs/2006/341%20papers/zwick341.pdf]

D. Outdoor education possibilities to increase environmental stewardship

...developing values is a lifelong process. As educators we can provide our students with the experiences and tools to help them become more knowledgeable about the environment and their place in it. Participation in outdoor pursuit's classes and programs can give all of us the opportunity for challenge, adventure and excitement. Perhaps most of all, the outdoor experience offers us a chance to explore and shape our values, attitudes, and behaviors towards the environment and ourselves. (Attarian, 1996, p. 44)

Intuition and past research suggests that early life experiences often influence what individuals believe later in life (Bogner, 2002); therefore supporting the notion that early childhood outdoor experiences (often recreational or during leisure time) are related to environmental beliefs (Kelly, 1989; Klingman, 1991, Mazze, 2006; Neill, 2002; Peterson et al., 2008; Yerkes & Haras, 1997). More specifically, participation in early-life appreciative outdoor activities, participation in early life consumptive outdoor activities, and exposure to media events focused on environmental issues and witnessing negative environmental events are related to adults' current environmental beliefs with potential to link with environmental stewardship (Ewert et al., 2005). Yet, previous hypotheses imply that significant life experiences in the outdoors shape individual ethics for natural resource stewardship (see Tanner, 2000 and Dunlap & Heffernan, 1975 in McMullin et al., 2007), a notion that comes with mixed evidence (DiEnno, 2009; McMullin et al., 2007; O'Connell, 2004; Neill, 1997).

Outdoor recreation may foster positive environmental attitudes and behavior among participants. As part of American culture, outdoor recreation and education potentially change destructive relationships between society and the environment (see Diamond, 2005 in Peterson et al. 2008). Some study results suggest higher environmental views relate positively to nonconsumptive /nonmotorized outdoor recreation participation (e.g., hiking, canoeing) and negatively to consumptive outdoor recreation participation (e.g., ATV use, fishing, hunting) for participants and their household members (Peterson et al., 2008). Holsman's (2000) review of literature indicates that hunters often hold attitudes and engage in behaviors that are not supportive of broad-based, ecological objectives. He suggests the need to enhance hunter stewardship through appeals to social norms and strengthened hunter education training that fosters moral norms and ecological understanding (Holsman, 2000); similar perspectives could be considered for other forms of consumptive / motorized forms of outdoor recreation.

In a program directed toward minorities, Hispanic adolescents showed positive gains in conflict resolution skills, stewardship of the environment, and knowledge and understanding of science concepts after a week-long residential outdoor education program for youth at risk (AIR, 2005).

Does participation in outdoor recreation activities improve the stewardship ethic of participants? In a study of boaters and anglers, sense of ownership, personal responsibility/locus of control, and awareness of consequences of human actions had the greatest effect on stewardship behavior among boaters and anglers (McMullin et al., 2007). Actual participation in boating and fishing had very little effect on environmental stewardship directly, but does on sense of ownership and personal responsibility. Active boaters and anglers vs. nonparticipants who had higher levels of ownership and personal responsibility for the environment are more likely to exhibit lifestyle and active stewardship behaviors. Research continues to support that outdoor recreation participants (i.e., anglers and boaters) are more likely to participate in stewardship tasks that protect their recreational resources than they are to protect the environment in general (Cottrell & Graefe, 1997; Cottrell, 2003a, 2003b). DiEnno (2009) in a study of volunteer participation in a community based ecological restoration project showed that although the project did not directly increase an environmental ethic, volunteers clearly expressed an increased knowledge of the environment and advocacy behaviors; most of the volunteers reported that they had strong ethics to begin with which is why they participated in the restoration project in the first place. This finding tends to support the importance of a sense of ownership claimed by others (McMullin et al., 2007) as well as the need to focus on nonparticipants in outdoor activities, outdoor skills programs, or volunteer programs (Beckman & Wright, 1993).

Programs most likely to change environmental stewardship behavior involve concrete, environmentally positive, action-oriented experiences; relevance; and long-term versus short-term involvement, support, follow-up, and reinforcement by positive role models (Matthews & Riley, 1995). Effective outdoor skills programs allow participants to gain in-depth knowledge; require them to use critical thinking skills; and involve application of what has been learned (Yerkes & Haras, 1997).

In a nationwide study of registered boat owners in 2008, a majority of boaters with formal boating education report more responsible environmental boater behavior (not painting or cleaning their boat in the water; properly disposed of waste at pumpout station, fueled at the dock, etc) (Responsive Management, 2010). The standardized boater education course process nationwide with a centralized certification agency, National Association of State Boating Law Administrators, seems to benefit a reduction of boating accidents and responsible environmental behavior.

Works cited and key readings:

- Responsive Management. (2010). Phase II: Registered boat owners' opinions on and attitudes toward boating safety education programs in 2008, Report for the National Association of State Boating Law Administrators, [From http://nasbla.org/files/NASBLA_2008_Phase_II_Survey_Report_Final-08-2010.pdf]
- American Institutes for Research (2005). Effects of outdoor education programs for children in California see http://www.air.org/reports-products/index.cfm?fa=viewContent&content_id=644.

- Attarian, A. (1996). Integrating values clarification into outdoor adventure programs and activities. *Journal of Physical Education, Recreation & Dance*, 67(8), 41-44.
- Bogner, F.X. (2002). The influence of a residential outdoor education program to pupil's environmental perception. *European Journal of Psychology of Education*, 17 (1), 19-34.
- Cottrell, S.P. & Graefe, A.R. (1997). Testing a conceptual framework of responsible environmental behavior. *Journal of Environmental Education*, 29(1), 17-27.
- Cottrell, S.P. (2003a). Influence of sociodemographics and environmental attitudes on general responsible environmental behavior among recreational boaters. *Environment and Behavior*, 35(3) 347-375.
- Cottrell, S.P. (2003b). Monitoring environmental behavior among recreational boaters. *The Environment Paper Series*, 6(2), 32-39. Glasgow Caledonian University, Scotland.
- DiEnno, C.M. (2009). A case study of social capital and collaboration as a communication process in an urban community-based ecological restoration project. Unpublished Dissertation. Colorado State University: Fort Collins, CO.
- Ewert, A. Place, G., & Sibthorp, J. (2005). Early-Life outdoor experiences and an individual's environmental attitudes. *Leisure Sciences*, 27, 225-239.
- Holsman, R.H. (2000). Goodwill Hunting? Exploring the Role of Hunters as Ecosystem Stewards, *Wildlife Society Bulletin*, 28, (4), 808-816.
- Kelly, J.R., (1989). Recreation demand, aging, and the life course. *World Leisure & Recreation*, 31(3), 25-28.
- Klingman, B.A. (1991). The call of the wild: investigating the relationship between adventure education, character development, and the college curriculum. Unpublished Dissertation. The College of William and Mary, Williamsburg, Virginia.
- Mazze, S. (2006). Beyond Wilderness: Outdoor education and the transfer of environmental ethics, Unpublished Master's Thesis, University of Oregon.
- Matthews, B. E., & Riley, C. K. (1995). Teaching and evaluating outdoor ethics education programs. Vienna, VA: National Wildlife Federation. (ERIC Document Reproduction Service No. ED 401 097) [From <http://www.eric.ed.gov/PDFS/ED401097.pdf>]
- McMullin S.L., Hockett, K.S., & McClafferty, J.A. (2007). Does angling or boating improve the stewardship ethic of participants? *American Fisheries Society Symposium*, 55, 145-155.
- Neill, J. T. (2002). *Outdoor education, ethics, and moral development*. Outdoor Education Research & Evaluation Center.
- Peterson, M.N. et al. (2008). Evaluating household-level relationships between environmental views and outdoor recreation: The Teton Valley Case, *Leisure Sciences*, 30, 293–305.
- Taylor, D. (1989). The influence of an outdoor adventure recreation class on personality type, locus of control, self-esteem, and selected issues of identity development of college students. Unpublished Dissertation. University of San Francisco, CA.
- Yerkes, R., & Haras, K. (1997). Outdoor education and environmental responsibility. ERIC Digest. [From <http://www.ericdigests.org/1998-2/outdoor.htm>]

E. Outdoor experience for teens has self-reported life-changing results

Life effectiveness is considered a multi-dimensional construct of self concept aimed “to enhance a person’s capacity to be effective in the multitude of tasks involved in life” (Neill et al., 2003, p. 6). Outdoor adventure / skills programs are founded on the belief that outdoor experience enhances learning as a result of cognitive, behavioral, and environmental factors where learning takes place when a person interacts with the environment. Substantial evidence over the years has shown a number of benefits of outdoor education programs for adolescents. Research has shown outdoor skills education programs to (see review in MacLeod & Allen-Craig, 2004, p 3):

1. Increase self-concept and self-concept domains such as independence, confidence, self-efficacy, and self understanding;
2. Enhance psychological well-being;
3. Increase ability to overcome challenges;
4. Positively impact on leadership competencies;
5. Enhance decision-making skills, general problem solving competencies, academic achievement and academic self-concept;
6. Increase personality dimensions such as assertiveness, emotional stability, achievement motivation, internal locus of control, and maturity and reductions in aggression and neurosis; and
7. Improve mental strength and interpersonal dimensions such as social competence, cooperation and interpersonal communication skills (Hattie et al., 1997).

Research findings imply that empowering program participants to take responsibility and make decisions lead to feelings of enhanced learning (Fengler & Schwarzer, 2008; Klingman, 1991; O'Connell, 2004; Paisley, 2004; Sibthorp et al., 2007; Taylor, 1989). Gatzemann et al. (2008) show that outdoor education had a positive effect in the improvement of various facets of self-esteem: achievement, physical attractiveness, emotional self-esteem, social self-esteem (both the security in contact and dealing with criticism), and one's fitness and body coordination. Hammitt (1995) investigated changes in NOLS students' behaviors, intentions, and attitudes as they pertain to the environment, and found a significant increase in responsible environmental behavior after a course experience.

In a more comprehensive study, Kellert (1998) found many elements of increased environmental skill, interest, and activity as a consequence of an outdoor wilderness experience, as well as overall appreciation, understanding, and concern for protecting the environment. Many respondents reported considerable improvement in numerous elements of personal development, problem-solving ability, interpersonal relationships, and applicability of program emphasized skills to everyday life. Most participants came from their wilderness experience feeling more capable, confident, optimistic, self-reliant, and equipped for pursuing lives of meaning and satisfaction. Flowers (2007) found that participants of a Hooked on Fishing (HOF) program, a place-based conservation education program in Montana, had a positive change for knowledge outcomes (knowledge about fish, aquatic habitats, and associated natural resources), and skills to use when fishing and recreating in the outdoors (i.e., fish identification, handling, cleaning, release, and equipment use).

Despite the wide scope of outdoor skills education programs (wilderness therapy, conservation education, camping programs etc.), a unifying theme seems to be the facilitation of emotional growth and well-being. Certain program types, like therapy programs, intentionally build emotional growth into their program structure. For others, programs like recreation and camping, growth is incidental to the main program goals, yet serves as an important benefit (Berman & Davis-Berman, 2000). As it pertains to hunting and fishing participation, well structured fishing and hunter education programs that capture the essence of personal growth and facilitate the numerous benefits or awareness of may lead to increased recruitment and retention (AIR, 2005).

Works cited and key readings:

- American Institutes for Research (AIR) (2005). Effects of outdoor education programs for children in California. see http://www.air.org/reports-products/index.cfm?fa=viewContent&content_id=644
- Berman, D.S., & Davis-Berman, J. (2000). Therapeutic uses of outdoor education. Charleston, WV: Clearinghouse on Rural Education and Small Schools, Appalachia Educational Laboratory. [Retrieved from <http://www.eric.ed.gov/PDFS/ED448011.pdf>]
- Fengler, J., & Schwarzer, C. (2008). Is there a self-concept change after participation in outdoor education programs? An evaluation study. *International Journal of Psychology*, 43 (3-4), 137-138.
- Flowers, A.B. (2007). Assessing the effectiveness of a place-based conservation education program by applying utilization-focused evaluation. Unpublished Dissertation. The University of Montana: Missoula, MT. [From http://www.boone-crockett.org/pdf/LF_ABFDissertationFinalMay2007.pdf]
- Gatzemann, T., Schweizer, K. & Hummel, A. (2008). Effectiveness of sports activities with an orientation on experiential education, adventure-based learning and outdoor-education, *Kinesiology*, 40(2),146-152.
- Goldenberg, M. & Pronsolino, D. (2008). A means-end investigation of outcomes associated with Outward Bound and NOLS programs. *Journal of Experiential Education*, 30 (3), 271-276.
- Hammit, J.P. (1995). Responsible environmental behavior: metaphoric transference of minimum-impact ideology. Montana State University, MS thesis. 108 pp.
- Kellert, S.R. (1998). A national study of outdoor wilderness experience. Unpublished report. New Haven, CT: Yale University. 104267 pp.
- Klingman, B.A. (1991). The call of the wild: investigating the relationship between adventure education, character development, and the college curriculum. Unpublished Dissertation. The College of William and Mary, Williamsburg, Virginia.
- McLeod, B., & Allen-Craig, S. A. (2004). An evaluation of an experiential learning and outdoor education school program on the life effectiveness skills of middle school boys. Retrieved June 22, 2010, from http://www.oeg.net.au/research/bibliography/mcLeod_allen-craig.pdf.
- Neill, J. T., Marsh, H. W., & Richards, G. E. (2003). The Life Effectiveness Questionnaire: Development and Psychometrics., *Sydney: University of Western Sydney*. [Retrieved from <http://wilderdom.com/JamesNeill/JamesNeillpublicationsPopular.htm>].
- O'Connell, T.S. (2004). Multidimensional self-concept and outdoor adventure education with adolescents. *Research in Outdoor Education*, 6, 84-93.
- Paisley, K. (2004). *Research in outdoor education, volume 7: A peer-reviewed publication of scholarship first presented at the Coalition for Education in the Outdoors Sixth Biennial Research Symposium: January 9-11, 2002, Bradford Wood, Indiana / Cortland, N.Y. :* Coalition for Education in the Outdoors.
- Sibthorp, J., Furman, N., Paisley, K., & Gookin, J. (2008). Long-term impacts attributed to participation in adventure education: Preliminary findings from NOLS. *Research in Outdoor Education*, 9, 86-103.
- Sibthorp, J., Paisley, K., & Gookin, J. (2007). Exploring participant development through adventure-based programming: A model from the National Outdoor Leadership School. *Leisure Sciences*, 29, 1-18.
- Taylor, D. (1989). The influence of an outdoor adventure recreation class on personality type, locus of control, self-esteem, and selected issues of identity development of college students. Unpublished Dissertation. University of San Francisco, CA.

F. Outdoor recreation and health benefits

Research into the benefits of outdoor adventure activities highlights the valuable contribution they make to personal health and wellbeing (Boniface, 2000; Dickson et al., 2008). Outdoor adventure activities provide opportunities for the connection of individuals with nature (the natural environment), direct connection with other people (interpersonal), and importantly, with themselves (personal) (Berman & Davis-Berman, 1995, 2000).

Research shows that lifestyle changes with the loss of connection to nature lead potentially to unhealthy lifestyles (Godbey et al., 2005). Today's children may be the first generation at risk of a shorter lifespan than their parents (see Children and Nature Network literature). Sedentary lifestyle and inactive physical activity contribute to the various health problems among today's children. Conditions such as obesity, asthma, attention-deficit disorder, obesity and vitamin D deficiency have all increased over the past few decades among children. These conditions may lead to pulmonary, cardiovascular, and mental health problems in adulthood, and disadvantaged children are most at risk. Low-income and minority children tend to be more isolated from nature due to the 'built environment': poor housing conditions, high-volume traffic, and a lack of parks and green space. Outdoor activity in the natural environment is secondary to television, video games, the computer, and a demanding schoolwork and after school schedules. While losing contact with the natural environment, today's youth miss opportunities for attention restoration, physical activity, stress reduction and healthy development (Maller et al., 2008).

Some slight changes in the benefits of outdoor recreation over previous studies of fishing were found among communities of color for achievement-oriented motivations and benefits including skill development, food benefit, and catching trophy fish (Hunt & Ditton, 2001; Schroeder et al., 2008; Toth & Brown, 1997). Other benefits were similar to Anglos such as relaxation and being with friends and family.

Positive experience in the outdoors involves restoration of adaptive resources that a person loses in meeting the demands of everyday life. Restoration may involve winding down emotionally and physiologically after a stressful day or recovering the capacity to focus attention after working on a long difficult task. Restoration is necessary to a person's continued effectiveness and well-being and works in some places better than in others. Natural environments rank highly among such restorative places. Since the early 60s, surveys consistently identify stress reduction and escape from stressors as important reasons for outdoor recreation (see review in Hartig et al., 2007).

In order for outdoor education to make a good contribution to students overall education and healthy lifestyles, a program must be structured to include continuous and progressive outdoor education throughout the educational experience (Woodhouse, 1987). Challenges to such an approach are sufficient resources and outdoor education planning across the curriculum (Selin et al., 2009).

A national Recreational Boating and Fishing Foundation survey indicates that 87% of Americans believe fishing and boating have a positive effect on family relationships. The survey also found that Americans believe boating and fishing could be the best ways to spend quality time with families (Nicol, n.d). Boating for recreation is closely tied to fishing with over

80% of the recreational boaters fishing as well (Response Management, 2002a; 2000b). Those people who participate in boater education programs are less apt to be in boating related accidents than those who have not (Best Practice, 2010; Responsive Management, 2004).

In a nationwide study of registered boat owners in 2008, 58% agree that boating is safer in states that have mandatory boater safety education courses. 66% of boaters who had an accident had no prior boater safety education. US Coast Guard boating and accident data show a correlation between lack of boating safety education and accidents. 73% of the accidents with injuries were among boaters with no formal education which increases to 80% of accidents with fatalities. Implications suggest that boating education as an outdoor skills program reduces accidents (Responsive Management, 2010).

Boaters more likely to take a boater education course tended to be located in coastal zones (characteristics are: tend to be males, sail boater, new to the state, live in larger cities or urban areas, BS degree or greater, active boaters with boats 16ft or longer). Boater education courses tend to enhance appropriate safety behavior as well as more frequent participation in safety practice (wearing a lifejacket, checking equipment, etc) (Responsive Management, 2010).

What aspects predict future participation in hunting and fishing?

According to Schroeder, Fulton et al., (2008, p. 13) “higher appreciation, affiliation, and health motivations, greater limitations related to cost, and being a married male or married female positively predicted intended fishing participation in the next year, while age, discrimination, and discomfort outdoors were negative predictors. The greater appreciation for fishing motivation and access constraints positively predicted whether fishing was a favorite activity, while discomfort was a negative predictor.” Further, “individuals who attribute multiple valued outcomes like appreciative, social, and health benefits to angling are those who intend to fish in the future. People who attribute more limited benefits from fishing might opt for hiking, bicycling, or other forms of outdoor recreation to efficiently deliver desired benefits” (p.13). A Roper (2002) study of ‘minority’ attitudes about and participation in fishing found that a key inducement to fishing would be “an invitation to fish from a child or friend.”

Works cited and key readings:

- Berman, D.S., & Davis-Berman, J. (1995). Outdoor education and troubled youth. Charleston, WV: Clearinghouse on Rural Education and Small Schools, Appalachia Educational Laboratory. [Retrieved from <http://www.ericdigests.org/1996-1/outdoor.htm>]
- Berman, D.S., & Davis-Berman, J. (2000). Therapeutic uses of outdoor education. Charleston, WV: Clearinghouse on Rural Education and Small Schools, Appalachia Educational Laboratory. [Retrieved from <http://www.eric.ed.gov/PDFS/ED448011.pdf>]
- Boniface, M.R. (2000). Towards an understanding of flow and other positive experience phenomena within outdoor and adventurous activities, *Journal of Adventure Education and Outdoor Learning*, 1(1), 55-68.
- Dickson, T.J. Gray, T. & Mann, K. (2008). Australian Outdoor Adventure Activity Benefits Catalogue, University of Canberra, Australia, <http://www.oric.org.au/IndustryNews/OutdoorActivityBenefitsCatalogueFinal270808.pdf>
- Godbey, G.C., Caldwell, L.L., Floyd, M., Payne, L.L. (2005). Contributions of leisure studies and recreation and park management research to give the active living agenda. *American Journal of Preventive Medicine*, 28(2S2), 150-158.

- Hartig, T., Kaiser, F.G. & Strumse, E. (2007). Psychological restoration in nature as a source of motivation for ecological behaviour, *Environmental Conservation*. 34(4), 291–299.
- Maller, C., Townsend, M., St. Leger, L., Henderson-Wilson, C., Pryor, A., Prosser, L., & Moore, M. (2008). The health benefits of contact with nature in a park context: A review of relevant literature. Deakin University and Parks Victoria. The original 2002 review and annotated bibliography are available online at:
http://www.parkweb.vic.gov.au/1process_content.cfm?section=99&page=16 .
- Nicol, K. (n.d.). Study shows fishing and boating as the #1 leisure activity for spending quality time with family.” Alexandria, VA: American Sportfishing Association. From
http://www.asafishing.org/content/newsroom/newspr_omni.cfm .
- Responsive Management (2000a). Saving Lives and Preventing Boating-Related Accidents. Manuscript by Response Management Unit for the National Association of State Boating Law Administrators <http://www.responsivemanagement.com/download/reports/NASBLAsafety.pdf>
- Responsive Management. (2002b). Factors related to recreational boating participation in the US. A Review of Literature. Manuscript by Response Management Unit for NASBLA. Retrieved 9/01/10 from <http://www.responsivemanagement.com/download/reports/boatingliteraturereview-dist.pdf>.
- Responsive Management. (2010). Phase II: Registered boat owners’ opinions on and attitudes toward boating safety education programs in 2008, Report for the National Association of State Boating Law Administrators, [From
http://nasbla.org/files/NASBLA_2008_Phase_II_Survey_Report_Final-08-2010.pdf]
- Selin, S., Hunt, F., Blanche, C., & Thompson, K. (2009). Outdoor recreation research and education for the 21st century: Defining national direction and building capacity. *Journal of Forestry*, October/November.
- Woodhouse, J. (1987). Outdoor activities – establishing a lifelong friendship. *Bulletin of Physical Education*, 23(3), 9-13.

G. Outdoor recreation influence on participation and attitudes

Research continues to support the notion that early life time outdoor recreation experience influences actual participation across the lifespan (Ewert, Place, & Sibthorp, 2005; McGuire & Dottavio, 1987; McGuire, Dottavio, & O’Leary, 1987). Meanwhile, as hunting participation continues to decline; figures from the Fish and Wildlife Service show that the number of hunters 16+ declined by 10% between 1996 and 2006 from 14 million to approximately 12.5 million.²³ Reasons are loss of hunting land to urbanization and perceptions of time and costs for hunting among families (USFWS, 2006). Also, the shift in value orientations from a dominant to more mutualist perspective where animals have rights plays a role (Manfredo et al., 2009; Manfredo & Teel, 2008). Some evidence implies that hunter education requirements may reduce hunter recruitment and retention (Heberlein & Thompson, 1997); however this effect was minimal with uncertain results. Hunter education programs appear more successful in states that have a hunting culture (Shultz et al., 2003). The danger is to assume that “hunter education” automatically means a new recruit (Wentz & Seng, 2000); “efforts to increase participation should focus on “becoming a hunter” and not on “going hunting” (p. ii). Hunter education programs tend to focus on the skills / technical aspects of hunting with little focus on social competence which is critical to the development of a long-term hunter (Shulz et al., 2003; Wentz & Seng, 2000). Long term participation depends on personal /cultural identity

²³ David Carey, The Associated Press, September 2, 2007,
http://www.prairiestateoutdoors.com/index.php?ps0/article/number_of_hunters_declining/

development in relation to hunting and shooting (Blair, 2007; Enck, Decker, & Brown, 2000; Response Management, 2003a, 2003b, 2004).

Examples exist of statewide efforts to retain and enhance hunting culture and heritage such as the 600 agencies in Wisconsin working to preserve and promote hunting heritage (see Hunter Network of Wisconsin Executive Summary http://www.huntersnetwork.org/?page_id=578). In addition, Enck et al. (2000) indicate that hunter participation indicators of recruitment and retention may not tell the whole story. Integrating participation with social-psychological indicators implies that recruitment and retention decreases are at a rate slower than participation indicators alone would depict (Leonard, 2007). There is more to understanding recruitment and retention than whether an individual participates in activities such as in the context of leisure constraints for nonparticipants (Backman & Wright, 1993). Leisure constraints on leisure are considered as structural (i.e., time, money, health that negatively influence participation), interpersonal (i.e., family obligations, lack of leisure partners, and others), and intrapersonal (i.e., low self esteem that limit participation) (see Crawford et al. 1991 in Zwick et al., 2006). Others distinguish between perceived and situational constraints (Miller & Vaske, 2003). The literature on leisure constraints signify the importance to differentiate between interested and uninterested nonparticipants (Miller & Vaske, 2003; Zwick et al., 2006). Perceived constraints for activity participation are influenced by life-cycle stages, psychological states, and attributes associated with the activity. Nonparticipants with an interest to participate may be constrained by barriers they perceive to their participation. Constraints for interested participants have been determined as *beyond agency control* (perceived personal constraints such as lack of finances, hunting partners, time and poor health) and *within agency control* (situational constraints such as hunting regulations, length of season, license fees, and access). Situational constraints are those aspects that an agency can change to encourage participation that might in essence change perception of personal constraints. With a shift from a dominant to mutualist value orientation towards wildlife (Manfredo & Teel, 2008; Manfredo et al., 2009), there may be a rise in negative attitudes towards hunting in particular and consumptive outdoor recreation participation in general. This implies a more proactive approach for management agencies (e.g., Wildlife agencies) to focus on nonparticipants versus participants (Backman & Wright, 1993; Miller & Vaske, 2003).

Significant progress was made in the 1980s to conceptualize and measure nonparticipation (see Backman & Wright 1993). Prior research examined such questions as *Do perceived constraints affect attitudes towards a specific activity (hunting) which influences participation?* Logically, attitudes should influence a desire to participate in an activity. Attitudes that potentially constrain participation in specific activities (fishing) are manifested in beliefs (i.e. fishing is unpleasant because of holding smelly fish and touching worms) (p. 3). Backman and Wright showed distinctive differences between four nonparticipants in hunting groups (i.e., nonparticipants with negative attitudes toward hunting, nonparticipants positive attitudes, former participants with negative attitudes, and former participants with positive attitudes) in education, gender, income, place of current and childhood residence, and parental attitude towards hunting. Non-hunters have higher income and live in urban areas more than former hunters. Parents of nonhunters holding negative attitudes towards hunting discouraged interest in hunting. Former hunters lived in rural communities as youth with parents who had been hunters themselves. Monetary constraints were more prevalent among nonhunters and former

hunters holding negative attitudes towards hunting. Implications suggest focusing on non / former participant interests, barriers, and attitudes towards outdoor skill related activities that provide access to and opportunities for hunting or fishing in urban environments. For example, the First Cast Program and others offered by Trout Unlimited since 2001 have had a substantial increase in participants in fishing programs (e.g., from 5000 in 2002 to over 14,000 in 2005) (Blair, 2007). Youth hunts in Massachusetts were perceived by both youth and their parents as providing opportunity for youth to be properly socialized into an overall hunting experience especially in deer hunting and target shooting. More than 60% of the parents who participated in a hunting education course had been deer hunting or target shooting with their child after the course while 78% of the youth had been deer hunting and 86% target shooting. The most important constraints on youth hunting were school, work, sports, and hobbies representing structural constraints which may be negotiated. “Interpersonal constraints, related to lack of family support and involvement in hunting throughout the year, suggesting that encouraging parental involvement with specialized youth hunts and providing programs to enhance skills among hunters of familial units may encourage youth and older family members to continue participating” (Zwick et al., 2006, p. 260). See section entitled *program provision* for additional review on successful outdoor skill program efforts.

According to the Outdoor Foundations annual Outdoor participation study 2009, the outlook on nature based activity participation is slightly better in 2008 than 2007 with slight increases in adults and minority groups with decreases in youth participation not as dramatic as in previous years (Outdoor Participation Report, 2009). When asked who influenced your decision to participate in outdoor activities among youth? parents remain the unanimous motivator for Hispanic (71%), African-American (50%), Asian /Pacific Islander (76%) and Caucasian (73%) followed by friends (from 32 to 43%), and relatives (26% to 34%). School programs were fourth overall followed by community programs (Boy Scouts, YMCA).

Works cited and key readings:

- Ewert, A. Place, G., & Sibthorp, J. (2005). Early-Life outdoor experiences and an individual’s environmental attitudes. *Leisure Sciences*, 27, 225-239.
- Manfredo, M. J., & Teel, T. L. (2008). Integrating concepts: Demonstration of a multilevel model for exploring the rise of mutualism value orientations in post-industrial society (Chapter 8). In M. J. Manfredo, Who cares about wildlife: Social science concepts for understanding human-wildlife relationships and other conservation issues. New York: Springer Press.
- Manfredo, M. J., Teel, T. L., & Henry, K. L. (2009). Linking society and environment: A multilevel model of shifting wildlife value orientations in the western United States. *Social Science Quarterly*, 90, 407-427.
- McGuire, F. A. & Dottavio, F.D. (1987). Outdoor participation across the lifespan – abandonment, continuity or liberation. *The International Journal of aging and human development*, 24(2), 87-100.
- McGuire, F. A., Dottavio, F.D., O’Leary, J.T. (1987). The relationship of early life experiences to later life leisure involvement. *Leisure Sciences*. 9(4), 251-257.

Constraints to hunting and fishing

- Backman, S. J., & Wright, B. A. (1993). An exploratory study of the relationship of attitude and the perception of constraints to hunting. *Journal of Park and Recreation Administration*, 11, 1–16. [From https://www.sagamorepub.com/ebooks/User/jpra1-18/JPRA11.2543/1993_11_2_1-16.pdf]
- Crawford, D.W., Jackson, E.L., & Godbey, G. 1991. A hierarchical model of leisure constraints. *Leisure Sciences*, 13, 309-320.
- Miller, C.A. & Vaske, J.J. (2003). Individual and situational influences on declining hunter effort in Illinois *Human Dimensions of Wildlife*, 8, 263–276.
- Zwick, R., Flaherty, J., Solan, D., Tisa, M., & Langlois, S. (2005). Perceived opportunities and constraints on participation in a Massachusetts youth hunt. *Proceedings of the 2005 Northeastern Recreation Research Symposium GTR-NE-341*, 254-261. [From http://www.fs.fed.us/ne/newtown_square/publications/technical_reports/pdfs/2006/341%20papers/zwick341.pdf]

Hunting and fishing participation

Fishing is the top rated nature based activity among Americans of all ages with 48 million participants in 2009 (17%) with more than 996 million outings. Fishing is recognized as the top gateway activity with 77% of fishing enthusiasts participating in multiple activities.²⁴ However, these numbers have dropped substantially since 2006 due to the economy and other constraints. Minority groups still tend to be a challenge for fishing and hunting activities.

- Blair, D. (2007). The Trout Unlimited experience teaching aquatic stewardship to youth, American Fisheries Society Symposium, 55, 79-84.
- Enck, J. W., Decker, D.J., & Brown, T.L. (2000). Status of Hunter Recruitment and Retention in the United States, *Wildlife Society Bulletin*, 28(4), 817-824.
- Floyd, M.F. & Lee, I. (2002). Who buys fishing and hunting licenses in Texas? Results from a statewide household survey, *Human Dimensions of Wildlife*, 7:91–106.
- Heberlein, T. A. & Thomson, E. (1997). The effects of hunter-education requirements on hunting participation and recruitment in the United States', *Human Dimensions of Wildlife*, 2: 1, 19 -31.
- Leonard, J. (2007). Fishing and Hunting Recruitment and Retention in the U.S. from 1990 to 2005 Addendum to the 2001 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation, Report 2001-11. From http://library.fws.gov/pubs/nat_survey2001_recruitment.pdf
- Measells, M.K., Grado, S.C., Sun, C. & Belli, K.L. (2002). Evaluating Mississippi's Hunting and Fishing Licenses and Fees, Publication No. FO299 of the Forest and Wildlife Research Center, Mississippi State University. [<http://sofew.cfr.msstate.edu/papers/0509measells.pdf>]
- Response Management. (2003a). Factors related to hunting and fishing participation among the nation's youth: Phase I Literature Review. Manuscript by Response Management Unit for USFWS. Retrieved 9/01/10 from <http://www.responsivemanagement.com/>.
- Response Management. (2003b). Factors related to hunting and fishing participation among the nation's youth: Phase V Final Report. Manuscript by Response Management Unit for USFWS. Retrieved 9/01/10 from <http://www.responsivemanagement.com/download/reports/FOF-dist.pdf>.
- Response Management. (2004). Issues Related to Hunting and Fishing Access in the United States: A Literature Review. Manuscript by Response Management Unit for USFWS. Retrieved 9/01/10 from

²⁴ A Special Report on Fishing and Boating, 2009 <http://www.outdoorfoundation.org/pdf/ResearchFishing2010.pdf>

http://www.responsivemanagement.com/download/reports/TRCA_Hunting_Fishing_Access_Lit_Review.pdf

Schulz, J.H., Millspaugh, J.J., Zekor, D.T., & Washburn, B.E. (2003). Enhancing sport-hunting opportunities for urbanites. *Wildlife Society Bulletin*, 31, (2), 565-573.

USFWS. (2006). National Survey of Fishing, Hunting, and Wildlife Associated Recreation, US Fish and Wildlife Service, from

http://wsfrprograms.fws.gov/Subpages/NationalSurvey/2006_Survey.htm

Wentz, J. & Seng, P. (2000). Meeting the challenge to increase participation in hunting and shooting, Newtown, CT. National Shooting Sports Foundation [From

<http://6fbd21e64bc817fd097aa54148bd3dab37bc10ee.gripelements.com/documents/ttankfinal.pdf>].

H. Program provision

Many studies are beginning to refer to a more holistic approach to outdoor skills programs / training (Henderson & Bialeschki, 2005; Neill, 1997; Riley, 1985; Roper Starch Worldwide, 2002; Schroeder, Nemeth, Sigurdson, & Walsh, 2008). Motives for engaging in outdoor activities with the family are a key element of participation for all populations (minorities, ethnic groups, white, etc.) (Fedler, 2001; Schroeder, Fulton et al., 2008). Minorities and ethnic groups perceive similar benefits of fishing and hunting as whites, yet face uniquely different constraints (i.e., selective law enforcement, discriminatory behavior, language and safety concerns such as skill and swimming) than the former (Schroeder et al., 2008). Suggestions for urban fisheries managers are to simplify communications, provide new media channels, confront discriminatory enforcement practice, and develop innovative educational programs (Hunt & Ditton, 2001; Riley, 1985). The Missouri Department of Conservation radically changed their hunting education program in the mid-80s to an outdoor skills program to include fishing and other types of outdoor pursuits. The vision was to encompass a broader perspective for the outdoors via outdoor recreational pursuits versus hunting alone (Riley, 1985). It is important to examine changing demographics (community of color). Further questions to explore are: 1) how to program and attract more minorities to outdoor recreation? And 2) how to increase family unity – among Caucasians via outdoor recreation participation?

According to Responsive Management (Duda et al., 2002), angler education programs and promotion programs for youth should focus on those people who already fish. Fishing among youth occurs mostly in a family context and the male family member (father) is the most crucial factor in determining participation among young girls. Education efforts should focus on fathers and appeals to wives and daughters (Leonard, 2007). A broader approach to fishing participation such as through aquatic education programs will have a better chance to enhance retention and recruitment of anglers (Best Practices Workbook, 2010; Leonard, 2007; Penne & Cushing, 2008).

There are many examples of best practice programs that illustrate a more integrated holistic approach to outdoor skills education while encouraging a connection to the outdoors.

- Arkansas Game and Fish Commission's Family and Community Fishing Program was developed in 2002 to enhance or create fishing opportunities (destinations) in urban environments so that excellent fishing opportunities are available. Starting with 10

stockable locations, the program grew to 36 locations in 2007. Fishing derbies and clinics are provided free offering opportunities for people to fish with families and friends in convenient locations. 61% of anglers in US live in urban areas by 2001 age 15 or greater (Racey et al., 2008).

- The 10th edition of the *Best Practices Workbook: For Boating, Fishing and Aquatic Resources Stewardship Education*, developed by The Recreational Boating and Fishing Foundation, provides a detailed integrated approach for program planning, development and implementation, professional development, program evaluation and educational program research about teaching boating, fishing and stewardship of aquatic resources. It provides straightforward criteria and tools for educators based on research and testing (Best Practices Workbook, 2010).
- The Community Fisheries Program (CFP), Utah Division of Wildlife Resources, has graduated 10,000 youth over a 7-year period. The program was created to provide fishing opportunities close to urban centers and recruit youth to fishing. The CFP illustrates successful partnerships between city and county governments (Penne & Cushing, 2008).
- The Alabama Division of Wildlife and Freshwater Fisheries offered youth hunts for dove, turkey, and squirrel. Of the youth that participated in these hunts, Alabama reports one-third of them were first-time hunters. Encouraged by this success, Alabama is moving forward with other youth-focused hunts for deer and waterfowl (Retrieved from AFWA <http://www.fishwildlife.org/about.html>).
- The Arizona Game and Fish Department initiated a Scholastic Clay Target program in 2004 to target young shooter recruitment. After the first year, this program has become the second-largest scholastic clay shooting program in the country (Retrieved from AFWA <http://www.fishwildlife.org/about.html>).
- Project Nature Connect is a web based environmental education program for elementary through advance degree training. The programs claim to fame is how to get people outdoors responsibly. The program has been in existence since 1985 (Thomas, 2005).
- *Becoming an Outdoors Woman* is a non-profit, educational program offering hands-on workshops to adult women. <http://www.uwsp.edu/cnr/bow/> (Houghton, et al., 2001).
- The California Department of Fish and Game's *Fishing Passport Program* challenges participants to fish their way around California for 150 fish and shellfish species. Similar to a passport, participants receive a special stamp for each catch they make. See <http://www.dfg.ca.gov/fishingpassport/>
- Structuring a Learning Experience is an article by Paul Nicolazzo that depicts the various stages of how to structure a learning experience for outdoor skills education. See OutdoorEd.com - The Outdoor Education Professional's Resource.
- The Children and Nature 2009 report on the Movement to Reconnect Children to the Natural World (pp. 43-49) provides a lengthy bullet list of what businesses, conservation groups, educators, governments, health care providers, and legal professions could do. The ideas are numerous with none depicted as the best way, yet listing approaches for different settings – some tested and many not.
See <http://www.childrenandnature.org/downloads/CNNMovement2009.pdf>

Works cited and key readings:

Best Practices Workbook (2010). *Best Practices Workbook: For Boating, Fishing and Aquatic Resources Stewardship Education*, for the Recreational Boating and Fishing Foundation.

- Alexandria, VA. [From http://www.rbff.org/Uploads/Resources_bestpractices/Best-Practices-Workbook-FINAL_2010.pdf].
- Duda et al., (2002). Attitudes of South Carolina youth towards aquatic resources and recreational fishing, Proceedings of the Fifty-Sixth Annual Conference of the Southeastern Association of Fish and Wildlife Agencies, 56, 421-433.
- Felder, T. (2001). Fishing, Boating and Aquatic Stewardship Education: Framework and Best Practices Recommendations. In Felder (2001). Defining best practices in boating, fishing, and stewardship education, pp. 4-17. [Retrieved September 1, 2010 from http://idea.uwosh.edu/wcgprojects/phy_edNONONO/programs/adaptedpe/documents/bestpracticesboat.pdf]
- Henderson K. A. & Bialeschki M. D. (2005). Leisure and Active Lifestyles: Research Reflections, *Leisure Sciences*, 27, 355–365.
- Leonard, J. (2007). Fishing and Hunting Recruitment and Retention in the U.S. from 1990 to 2005 Addendum to the 2001 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation, Report 2001-11. From http://library.fws.gov/pubs/nat_survey2001_recruitment.pdf
- Marcinkowski, T. (2001). An overview of an issue and action instruction program for stewardship education, In Felder (2001). Defining best practices in boating, fishing, and stewardship education, pp. 98-128. Recreational Boating and Fishing Foundation, Retrieved September 1, 2010 from http://www.rbff.org/uploads/Resources_bestpractices/tommark_paper.pdf]
- Neill, J.T. (1997). Outdoor Education in the Schools: What Can It Achieve? In Catalysts for Change: 10th National Outdoor Education Conference Proceedings Jan, 20-24, pp. 193-201. [Retrieved June 10, 2010 from <http://wilderdom.com/html/OutdoorEducationInSchoolsWhatCanItAchieve.html>].
- Penne, C. & Cushing, A. (2008). Utah's Community Fishing Program: Landing Partnerships in Fisheries Management and Education, *American Fisheries Society Symposium*, 67, 203-207.
- Racey, C.L., Clifton, J. & Coleman, C.L. (2008). Arkansas Game and Fish Commission's Family and Community Fishing Program, *American Fisheries Society Symposium*, 67, 247-253.
- Riley, C.K. (1985). Missouri outdoor recreation skills program. Hunter education and more. Transactions of the North American Wildlife and Natural Resources Conference, p. 109-112.
- Schroeder, S.A., Fulton, D., Nemeth, M.L., Sigurdson, R.E., & Walsh, R.J. (2008). Fishing in the Neighborhood: Understanding Motivations and Constraints for Angling Among Minneapolis-St. Paul, Minnesota Metro Residents, *American Fisheries Society Symposium*, 67, 77-95. [Retrieved August 29, 2010 from http://files.dnr.state.mn.us/publications/fisheries/educational_reports/fin_understanding.pdf]
- Schroeder, S.A., Nemeth, M.L., Sigurdson, R.E. & Walsh, R.J. (2008). Untangling the line: Constraints to fishing participation in communities with color. *American Fisheries Society Symposium*, 67, 97-112.
- Thomas, J. (2005). On All Nine Legs: Teaching Outdoor Love to an Indoor World. *The Taproot*: a publication of the Coalition for Education in the Outdoors, 15(1), 4-6.

I. Wildlife Value Orientations

Researchers at Colorado State University and others (Duda & Brown, 1999; Flannery & Whiting, 2003; Manfredo et al., 2003, 2009) have been conducting studies of wildlife value orientations with results implying a fundamental shift from a dominant / utilitarian value towards wildlife to a more caring / mutualist orientation. A number of thesis research projects support the claims for such attitude shifts (Flannery, 2001; McCoy, 2010). Implications for outdoor skills education include a broader based approach to conservation education with outdoor skills versus activity specific.

Key readings:

- Duda, M. D. & K. L. Brown. (1999). Hunters' and anglers' awareness of and attitudes toward wildlife in Texas. *North American Wildlife and Natural Resources Conference Transactions* 66:96-109
- Flannery, K. E. C. (2001). Children's attitudes towards wildlife: A comparison by ethnicity and community size (Master's Thesis, Stephen F. Austin State University, 2001). *Masters Abstracts International*, 39, 759.
- Flannery, K. & Whiting, R.M. (2003). Children's attitudes towards wildlife: A comparison of ethnicity and community size. *Proceedings of the Annual Conference of Southeastern Fish and Wildlife Agencies*, 57, 280-290.
- Manfredo, M.J., Teel, T.L. & Bright, A.D. (2003). Why are public values toward wildlife changing? *Human Dimensions of Wildlife*, 8, 287-306.
- Manfredo, M. J., Teel, T. L., & Henry, K. L. (2009). Linking society and environment: A multilevel model of shifting wildlife value orientations in the western United States. *Social Science Quarterly*, 90, 407-427.
- McCoy, C. (2010). Integrating information on wildlife values and barriers to participation in nature-based programs to improve agency efforts for connecting families to nature. Unpublished Thesis Master Thesis. Colorado State University, Fort Collins, CO., 2010.

SECTION IV. CONCLUSIONS AND RECOMMENDATIONS

The purpose of this review of literature was to determine the extent to which positive impacts of outdoor skills education and wildlife related outdoor education are documented with respect to health, lifestyle and student learning. Information that documents the extent to which students who participate in outdoor skills education go on to become hunters and anglers was examined as well. The conclusions provide a list of successful practice programs featuring integrated approaches for outdoor skills education to connect children to nature. Recommendations for agencies, educators, and governmental organizations are given for conservation education. Future research suggestions are listed for further consideration.

A. Conclusions

Interpersonal and intrapersonal skills developed through engaging in nature based activities in meaningful ways represent some of the main benefits of outdoor skills education. Benefits for the natural environment are not as readily evident, yet indirectly noted as developing more sensitive individuals and communities towards the environment, and the development of environmental awareness and stewardship ethics. Health and learning benefits were evident in the physical, psychological and spiritual context, specifically with regards to developing self efficacy, intellectual flexibility, personal skills (time management), and relationship building. The benefits that result from participating in outdoor activities can be enhanced through appropriate facility provision and access to natural resources as well as the design of outdoor skills education programs that work towards specific objectives. Outdoor adventure / skills programs are founded on the belief that outdoor experience enhances learning as a result of cognitive, behavioral, and environmental factors where learning takes place when a person interacts with the environment. Substantial evidence over the years has shown a number of benefits of outdoor education programs for adolescents (Hattie et al., 1997; MacLeod & Allen-Craig, 2004; Neill et al., 2003).

In general, these benefits are:

1. Increase self-concept and self-concept domains such as independence, confidence, self-efficacy, and self understanding;
2. Enhance psychological well-being;
3. Increase ability to overcome challenges;
4. Positively impact on leadership competencies;
5. Enhance decision-making skills, general problem solving competencies, academic achievement and academic self-concept;
6. Increase personality dimensions such as assertiveness, emotional stability, achievement motivation, internal locus of control, and maturity and reductions in aggression and neurosis; and
7. Improve mental strength and interpersonal dimensions such as social competence, co-operation and interpersonal communication skills

In particular to health, learning, and lifestyle, the following benefits of outdoor skills programs are highlighted:

Benefits to Health

- *Outdoor education promotes lifelong physical, emotional and spiritual well-being* - A growing body of studies suggests that contact with nature is as important to children as good nutrition and adequate sleep; time spent outdoors correlates with increased physical activity and fitness in children; exposure to green space reduces crime, increases general wellbeing and ability to focus; children as young as five have shown a significant reduction in the symptoms of Attention Deficit Disorder when they are engaged in outdoor activities in natural settings (Holmes, 2007).
- Outcomes for physical, emotional and spiritual wellbeing were enhanced when students spent more time outdoors in nature. Research indicates that there could be improvements in nutrition, physical activity, reductions in crime and ADD as a result of outdoor education (Holmes, 2007 and <http://www.coeo.org/documents/RSExecSummary.pdf>).
- In a program directed toward minorities, Hispanic adolescents showed positive gains in conflict resolution skills, stewardship of the environment, and knowledge and understanding of science concepts after a week-long residential outdoor education program for youth at risk (AIR, 2005).
- *Outdoor education educates for character* – Outdoor Education (OE) provides powerful opportunities for extensive personal and interpersonal growth, particularly when trained outdoor educators are involved in all aspects of the program. Major research studies have found that:
 - Many character traits are significantly enhanced as a result of OE experiences, including creativity, enthusiasm, self-motivation, self-understanding, assertiveness, maturity, independence, and self-confidence; and
 - Many social skills are also enhanced through OE experiences, including cooperation, effective communication, decision making, problem solving, task leadership, and social competence (see <http://www.coeo.org/pathways/PW19.4Summer07.pdf>).
- OE promotes marked improvements in behavior for special populations such as at risk youth. Retention and continued growth in these areas is also evident as a result of such hands-on experiences (see <http://www.coeo.org/pathways/PW19.4Summer07.pdf>).
- In a study to examine factors that motivate or constrain outdoor recreation (e.g., fishing) among urban and suburban dwellers in Minnesota, appreciation (i.e., enjoying nature and the outdoors) and health (i.e., stress reduction) were the two greatest motivators (Schroeder et al., 2008). Many studies imply that use and exposure to the outdoors and park-like settings through outdoor activities can improve moods, perceived wellness, and increase longevity. More specifically, access and use of local park and recreation opportunities (e.g., running, cycling, fitness programs) is associated with increased physical activity and such activities are associated with improved health aspects such as lower blood pressure and perceived physiological - psychological health (see review in NRPA, 2008).
- *Outdoor education directly exposes children and youth to the natural environment in ways that develop powerful, knowledgeable and lifelong connections essential for a healthy and sustainable future.*

- Research also shows that early, sequenced and repeated experiences in the outdoors develop a kinship with nature that can evolve into an informed, proactive and lifelong stewardship of our natural environment;
- Children love to be part of the solution – especially when they are able to see the effects of their positive interaction with nature first-hand (see <http://www.coco.org/pathways/PW19.4Summer07.pdf> and Holmes, 2007).

Benefits to Learning

- Rickinson et al., (2004, p. 27) suggest there is “considerable evidence to suggest that outdoor adventure programs can impact positively on young people’s attitudes, beliefs and self-perceptions.” Other benefits include improved academic abilities, awareness of nature and the environment, problem solving, outdoor skills, and values clarification.
- Research shows that students who participated in outdoor education with the local environment as a comprehensive focus and framework for curricula demonstrate increased engagement with and enthusiasm for learning, improved academic performance, and better language skills; have shown greater sense of pride and ownership in accomplishments and a variety of substantially increased critical thinking skills (Holmes, 2007).
- *Reconnecting children through outdoor education, 2007* – is a report of evidence-based research on outdoor and experiential education (OEE) in Canada that shows a relationship between OEE and real-life situations. OEE participants had better engagement and enthusiasm for learning; better academic results; and a greater connection with their achievements as well as improvements in critical thinking.
- Children who are more active outdoors and hang out outdoors tend to engage in greater physical activity as youth and later as adults (CDCP, 2010).
- When children and adolescents participate in the recommended level of physical activity, at least 60 minutes daily, multiple health benefits accrue. Student physical activity may help improve academic performance including academic achievement (e.g., grades, standardized test scores); academic behavior (e.g., on-task behavior, attendance); and factors that can positively influence academic achievement (e.g. concentration, attention, improved classroom behavior) (CDCP, 2010).

Benefits to Lifestyle

- Flowers (2007) found that participants of a Hooked on Fishing (HOF) program, a place-based conservation education program in Montana, had a positive change for knowledge outcomes (knowledge about fish, aquatic habitats, and associated natural resources), and skills to use when fishing and recreating in the outdoors (i.e., fish identification, handling, cleaning, release, and equipment use).
- Research shows that outdoor recreation programs and outdoor educator efforts can influence perceived development of life effectiveness skills among adolescent outdoor participants. Allen-Craig & Miller’s (2007) results indicate that life effectiveness skills

after a 5-day camp improved significantly from Pretest to Posttest. Enhanced life effectiveness skills may enhance healthy lifestyles.

- Meaningful engagement with nature as a child has a direct correlation with involvement in environmental issues in the future which is of great interest as communities look for the next generation of environmental leaders and activists.
- The Leisure Trends index implies that people who participate in outdoor activities tend to be happier than those who do not (see <http://www.leisuretrends.com/>). Implications are that active living may lead to a healthier lifestyle (CDCP, 2010; Children and Nature www.childrenandnature.org/; National Recreation and Park Association www.nrpa.org; USDHHS, 2002).
- There is clear evidence that those who are active in their school years are more active as adults as well as in high calorie burning activities.
- The most important forms of participation in outdoor recreation are those that become routine and regular, part of one's lifestyle. The greatest health benefits are associated with close-to-home outdoor recreation. Proximity, in other words, is a critical variable determining rates of participation, and this should serve as a wake-up call for public officials and urban planners to ensure that parks and open space are woven into a community's fabric, an essential ingredient in community livability. Until recently, there was not a recognized base of rigorous scientific research linking parks, outdoor activities, and recreation to better health outcomes. Consequently, the words 'recreation' and 'outdoor resources' provided little traction or political salience in setting priorities for improving health. The link between lack of physical activity and obesity has now been documented and provides a compelling case, during the ongoing national debate on health care reform, for promoting greater outdoor activity as a cost-effective, preventive approach to better health (*Great Outdoors America: The Report of the Outdoor Resources Review Group*, July 2009).

Hunting and Fishing Participation

- For hunting participation in general, the most important opportunities for youth and parents in a hunting education program are opportunities to learn how to hunt and find game with others, to learn from an experienced hunter (mentorship), and to apply what was learned in the hunter education course. Learning how to shoot was the most important to youth while learning about guns and safety was for adults. More than 78% of the youth who had participated in a hunter education program in Massachusetts reported deer hunting after the course while 86% went target shooting (Zwick et al., 2006).
- Active boaters and anglers vs. nonparticipants who had higher levels of ownership and personal responsibility for the environment are more likely to exhibit lifestyle and active stewardship behaviors (McMullin et al., 2007). Research continues to support that outdoor recreation participants (i.e., anglers and boaters) are more likely to participate in stewardship tasks that protect their recreational resources than they are to protect the environment in general (Cottrell & Graefe, 1997; Cottrell, 2003a, 2003b).

- According to Schroeder, Fulton et al., (2008, p. 13) “higher appreciation, affiliation, and health motivations, greater limitations related to cost, and being a married male or married female positively predicted intended fishing participation in the next year, while age, discrimination, and discomfort outdoors were again negative predictors. The greater appreciation for fishing motivation and access constraints positively predicted whether fishing was a favorite activity, while discomfort was a negative predictor.” Further, “individuals who attribute multiple valued outcomes like appreciative, social, and health benefits to angling are those who intend to fish in the future. People who attribute more limited benefits from fishing might opt for hiking, bicycling, or other forms of outdoor recreation to efficiently deliver desired benefits” (p.13).
- A Roper (2002) study of ‘minority’ attitudes about and participation in fishing found that a key inducement to fishing would be “an invitation to fish from a child or friend.”
- Minority groups continue to consistently fish less than Anglos nationally; however projections indicate that the greatest percentage increase in participation will be among these groups due to population increases (see Murdock et al. (1992) in Hunt & Ditton, 2002; Pullis, 2000).

Discussion

Clearly, outdoor activities have a positive impact on *self*, and *others* and presumably on the *environment* in a general context. The benefits of outdoor skills education are noted across a diversity of programs that utilize such activities (e.g. recreation, leisure and sport, education, health and therapy), in the wide array of outdoor environments in which they take place, from urban nature parks to pristine wilderness. However, this is more difficult to pinpoint specifically to hunting and fishing participation, recruitment and retention. The most effective outdoor skill programs tend to be in structured programs: that are of longer duration; that are culturally appropriate; and where the effects appear to increase further over time. Some of the research challenges to show direct benefits of hunting and fishing education programs are the lack of longitudinal research beyond participation studies. Participation overall will likely continue to decrease due to population shifts to urban environments, increases in minority groups that tend not to participate in fishing and hunting, aging society, further habitat fragmentation and access to places to hunt more specifically, climate change and others. The good news is that overall Americans seem to have returned to nature in 2008 with increases in participation like backpacking, mountain biking and trail running that showed double-digit increases in participation, and hiking and camping with 9 percent and 7 percent increases, respectively. In addition, interest in and the popularity of fishing is still high on the list with 17% of American 6 years or older participating in freshwater, saltwater or fly fishing in 2008 representing the number one gateway activity by rate of participation and third by frequency of participation (number of outings). Freshwater fishing participation had a slight increase in 2009 over 2008 with core outdoor activity participation rates increased overall due to the economic downturn.²⁵ Although hunting participation decreased overall, bow and rifle hunting participation increased. In a time of economic crisis, people tend to recreate closer to home,

²⁵ Outdoor Recreation Participation Topline Report, 2010
<http://www.outdoorfoundation.org/pdf/ResearchParticipation2010Topline.pdf>

participate more in outdoor activities, spend less on equipment, and engage in activities that can be done in one day to keep costs down and fit busy schedules.

The prevalent indicators of recruitment and retention for hunting and fishing are structured programs, mentorship, culturally appropriate messaging and communication, outcomes oriented programs connected to attitude shifts (dominant/utilitarian value to caring/mutualism/animals have rights) and an environmental ethic, accessible and convenient as a means to overcome the constraints to hunting and fishing. Familial context and early life experiences will always be key indicators of lifelong retention. There are many examples of successful hunting and fishing programs at the international, national, state and local level (see list of successful strategies) and based on anecdotal observations and short term evaluation and monitoring do show marked participation increases with evidence-based benefits.

Overall, the literature implies the need to adopt a broader based conception of health from a holistic ecological perspective that moves beyond human physical and mental health to one that includes familial, communal, national, international, and global ecological health. Active living is crucial to healthy lifestyles and leads to potentially greater participation in fishing and hunting.

There are many examples of successful practice programs that illustrate a more integrated holistic approach to outdoor skills education and encouraging a connection to the outdoors. The following provide just a few of those examples that stood out from the review of literature conducted.

- Arkansas Game and Fish Commission's Family and Community Fishing Program was developed in 2002 to enhance or create fishing opportunities (destinations) in urban environments so that excellent fishing opportunities are available. Starting with 10 stockable locations, the program grew to 36 locations in 2007. Fishing derbies and clinics are provided free offering opportunities for people to fish with families and friends in convenient locations. 61% of anglers in US live in urban areas by 2001 age 15 or greater (Racey et al., 2008).
- The 10th edition of the *Best Practices Workbook: For Boating, Fishing and Aquatic Resources Stewardship Education*, developed by The Recreational Boating and Fishing Foundation, provides a detailed integrated approach for program planning, development and implementation, professional development, program evaluation and educational program research about teaching boating, fishing and stewardship of aquatic resources. It provides straightforward criteria and tools for educators based on research and testing (Best Practices Workbook, 2010).
- The Community Fisheries Program (CFP), Utah Division of Wildlife Resources, has graduated 10,000 youth over a 7-year period. The program was created to provide fishing opportunities close to urban centers and recruit youth to fishing. The CFP illustrates successful partnerships between city and county governments (Penne & Cushing, 2008).
- The Alabama Division of Wildlife and Freshwater Fisheries offers youth hunts for dove, turkey, and squirrel. Of the youth that participated in these hunts, Alabama reports one-third of them were first-time hunters. Encouraged by this success, Alabama is moving forward

with other youth-focused hunts for deer and waterfowl (Retrieved from AFWA <http://www.fishwildlife.org/about.html>).

- The Arizona Game and Fish Department initiated a Scholastic Clay Target program in 2004 to target young shooter recruitment. After the first year, this program has become the second-largest scholastic clay shooting program in the country (Retrieved from AFWA <http://www.fishwildlife.org/about.html>).
- Project Nature Connect is a web based environmental education program for elementary through advance degree training. The programs claim to fame is how to get people outdoors responsibly. The program has been in existence since 1985 (Thomas, 2005) which is an indicator of its longer term success.
- *Becoming an Outdoors Woman* is a non-profit, educational program offering hands-on workshops to adult women. <http://www.uwsp.edu/cnr/bow/> (Houghton, et al., 2001).
- The California Department of Fish and Game's *Fishing Passport Program* challenges participants to fish their way around California for 150 fish and shellfish species. Similar to a passport, participants receive a special stamp for each catch they make. See <http://www.dfg.ca.gov/fishingpassport/>
- Structuring a Learning Experience by Paul Nicolazzo depicts the various stages of how to structure a learning experience for outdoor skills education. See OutdoorEd.com - The Outdoor Education Professional's Resource.
- The Children and Nature 2009 report on the Movement to Reconnect Children to the Natural World (pp. 43-49) provides a lengthy bullet list of what businesses, conservation groups, educators, governments, health care providers, and legal professions could do. The ideas are numerous with none depicted as the best way, yet listing approaches for different settings – some tested and many not. See <http://www.childrenandnature.org/downloads/CNNMovement2009.pdf>
- Boater education courses tend to enhance appropriate safety behavior as well as more frequent participation in safety practice (wearing a lifejacket, checking equipment, etc) (Responsive Management, 2010).

B. Recommendations

Appendix B provides an overview of ideas posed by the Children and Nature Networks 2009 Report on the Movement to Reconnect Children to The Natural World for what conservation groups, agencies, educators, businesses, health care providers, legal professions and governments can do to enhance the connection of children to nature. Meanwhile, some recommendations for outdoor skills programs drawn from the literature review follow:

- In 1995, a report was published for the national Wildlife Federation that outlined strategies for encouraging and outdoor ethics. 300 references are provided that cover approaches to outdoor ethics education for public awareness campaigns and codes of ethics; user education courses; interactive methods; Project Wild; use of role models; mentoring;

community clubs; and peer teaching (Matthews & Riley, 1995 – see <http://www.eric.ed.gov/PDFS/ED401097.pdf>)

- Outdoor skills education efforts should increase the sense of personal ownership of natural resources. This can be done by personal and political involvement in conservation causes (McMullin et al., 2007).
- Although there is some link between actual participation in outdoor activities and some stewardship effort, conservation educators and resource managers should not continue to just rely on that fallacy (McMullin et al., 2007) and that other factors play a role for recruitment and retention over a longer time frame.
- Volunteer programs such as the Partners for Native Plants (PNP) group should focus on volunteer expectations to enhance volunteer retention. For instance, in the PNP project in Denver, just as those who experienced direct benefits continued their engagement with the PNP project, those who did not lessened or completely ended their involvement.
- To be successful in volunteer conservation projects, project managers should tailor outdoor projects to explain their environmental significance; such efforts tend to retain volunteers (see Bruyere & Rappe, 2007 in DiEnno, 2009).
- Research results suggest that appreciative, social, and health motivations are associated with intended participation in fishing, so managers could emphasize these benefits to encourage participation (Shroeder, Fulton et al., 2008).
- Results of a study of anglers in urban environments indicate that people who perceive higher access and cost constraints report greater intentions to fish in the future, managers could market fishing as a low-cost retreat from negative aspects of the urban environment (Schroeder, Fulton et al., 2008). In addition to stocking fish and providing fishing docks, urban fisheries managers might focus on structural constraints to angling (Miller & Vaske, 2003). Shroeder, Fulton et al found that potential discomfort and discrimination limited intended participation in fishing. To compensate, urban fisheries managers could offer comfortable structures for angling. Managers might also focus on regulations, access, license fees, and agency trust to increase urban angling participation.
- Mangun et al. (2007) cited in Schroeder, Fulton et al. (2008) assessed how stakeholder perceptions influenced hunter participation and described three areas of perceived situational constraints to hunting: quality of experience, regulatory environment, and trust. Similar factors likely affect urban fishing participation. Programs might work to adjust aspects of the regulatory environment (e.g., license fees and vendors). Free fishing days, reduced-price licenses exclusively for urban angling, and more convenient license vendors might increase participation. Programs affiliated with local community organizations or led by diverse community members might increase agency trust and subsequently increase urban angling participation. Public or private fishing opportunities that provide equipment and do not require licenses might also increase interest and participation in angling among urban populations.
- Wildlife agencies must interact with a broader range of society versus sportsmen only to examine anti-activity attitudes and beliefs to help formulate programs to address or modify negative attitudes (Backman & Wright, 1993).

- Support for use of green space and natural areas as safe havens for nature experience is necessary to encourage adult acceptance of child play in more wild places (ILI, 2010).
- Parks and Recreation programs have golden opportunities to advance healthy student lifestyles in after-school settings; complementing school efforts can engage kids in healthy lifestyle choices. For instance, Park and Recreation departments could encourage and promote the afterschool programs they offer to communities. Linkages with such programs as the Lights On Afterschool with the Afterschool Alliance, a non-profit organization dedicated to ensuring that all children have access to high quality and affordable after-school programs (Hobbs-Viniuan, 2006; NRPA, 2008) is suggested. These efforts highlight the importance of networking between agencies to share resources and expertise.
- Resource managers should simplify communications, use new media mechanisms, mediate discriminatory law enforcement, and develop innovative outdoor skills programs to address the unique barriers to outdoor activities faced by minorities (Schroeder et al., 2008).
- As it pertains to hunting and fishing participation, well structured fishing and hunter education programs that capture the essence of personal growth and facilitate the numerous benefits or awareness of may lead to increased recruitment and retention (AIR, 2005).
- In order for outdoor education to make a good contribution to students overall education and healthy lifestyles, a program must be structured to include continuous and progressive outdoor education throughout the educational experience (Woodhouse, 1987).
- A Roper (2002) study of ‘minority’ attitudes about and participation in fishing found that a key inducement to fishing would be “an invitation to fish from a child or friend.

C. Future Research

- It is important to examine changing demographics (community of color). Further questions to explore are: 1) how to program and attract more minorities to outdoor recreation? And 2) how to increase family unity – among Caucasians via outdoor recreation participation?
- Future research should address how household dynamics (e.g., changing household size and family structure) mediate the relationship between outdoor recreation and environmental views.
- A study of people who used to fish and no longer do so is recommended. A similar approach should be applied to outdoor recreation participation in general.
- There is a distinct shortage of studies investigating the potential of outdoor education to enhance academic achievement.
- An area awaiting further investigation is the effect that outdoor education programs can have on school climate and student culture.
- Comparative studies of outcomes from different outdoor education programs are rare, particularly for school student programs.
- Focus on how anti-activity (anti-hunting) attitudes form (Backman & Wright, 2003).

- Evidence of programs that influence participation is difficult to document; there is a need to conduct more longitudinal studies of program participants to examine participation patterns.
 - Which programs lead to 1st time participation and retention? – is it the activity oriented or broader based such as camping and outdoor skills.

BIBLIOGRAPHY

- Allen-Craig, S. & Miller, J. (2007). Can outdoor educators make a difference? The effect of outdoor educators on achieving program outcomes. *ACHPER Healthy Lifestyles Journal*, 54(2), 5-12. (Article 4)
- American Institutes for Research (2005). Effects of outdoor education programs for children in California see http://www.air.org/reports-products/index.cfm?fa=viewContent&content_id=644.
- Attarian, A. (1996). Integrating values clarification into outdoor adventure programs and activities. *Journal of Physical Education, Recreation & Dance*, 67(8), 41-44.
- Backman, S. J., & Wright, B. A. (1993). An exploratory study of the relationship of attitude and the perception of constraints to hunting. *Journal of Park and Recreation Administration*, 11, 1-16. [From https://www.sagamorepub.com/ebooks/User/jpra1-18/JPRA11.2543/1993_11_2_1-16.pdf]
- Berman, D.S., & Davis-Berman, J. (1995). Outdoor education and troubled youth. Charleston, WV: Clearinghouse on Rural Education and Small Schools, Appalachia Educational Laboratory. [Retrieved from <http://www.ericdigests.org/1996-1/outdoor.htm>]
- Berman, D.S., & Davis-Berman, J. (2000). Therapeutic uses of outdoor education. Charleston, WV: Clearinghouse on Rural Education and Small Schools, Appalachia Educational Laboratory. [Retrieved from <http://www.eric.ed.gov/PDFS/ED448011.pdf>]
- Best Practices Workbook (2010). Best Practices Workbook: *For Boating, Fishing and Aquatic Resources Stewardship Education*, for the Recreational Boating and Fishing Foundation. Alexandria, VA. [From http://www.rbff.org/Uploads/Resources_bestpractices/Best-Practices-Workbook-FINAL_2010.pdf].
- Blair, D. (2007). The Trout Unlimited experience teaching aquatic stewardship to youth, American Fisheries Society Symposium, 55, 79-84.
- Bogner, F.X. (2002). The influence of a residential outdoor education program to pupil's environmental perception. *European Journal of Psychology of Education*, 17 (1), 19-34.
- Boniface, M.R. (2000). Towards an understanding of flow and other positive experience phenomena within outdoor and adventurous activities, *Journal of Adventure Education and Outdoor Learning*, 1(1), 55-68.
- C&NN (2009). Children and Nature 2009: A Report on the Movement to Reconnect Children to the Natural World. Prepared by the Child and Nature Network and EcoAmerica, [From <http://www.childrenandnature.org/downloads/CNNMovement2009.pdf>]
- CDCP - Centers for Disease Control and Prevention. (2010). *The association between school based physical activity, including physical education, and academic performance*. Atlanta, GA: U.S. Department of Health and Human Services. [Retrieved August 1, 2010 from http://www.cdc.gov/healthyyouth/health_and_academics/pdf/pa-pe_paper.pdf]
- Cordell, H.K., Betz, C.J. and Green, G.T. (2008). Nature-based outdoor recreation trends and wilderness. *International Journal of Wilderness*, 14(2), 7-13.
- Cottrell, S.P. & Graefe, A.R. (1997). Testing a conceptual framework of responsible environmental behavior. *Journal of Environmental Education*, 29(1), 17-27.
- Cottrell, S.P. (2003a). Influence of sociodemographics and environmental attitudes on general responsible environmental behavior among recreational boaters. *Environment and Behavior*, 35(3) 347-375.
- Cottrell, S.P. (2003b). Monitoring environmental behavior among recreational boaters. *The Environment Paper Series*, 6(2), 32-39. Glasgow Caledonian University, Scotland.
- Crawford, D.W., Jackson, E.L., & Godbey, G. (1991). A hierarchical model of leisure constraints. *Leisure Sciences*, 13, 309-320.

- Dickson, T.J. Gray, T. & Mann, K. (2008). Australian Outdoor Adventure Activity Benefits Catalogue, University of Canberra, Australia, <http://www.oric.org.au/IndustryNews/OutdoorActivityBenefitsCatalogueFinal270808.pdf>
- DiEnno, C.M. (2009). A case study of social capital and collaboration as a communication process in an urban community-based ecological restoration project. Unpublished Dissertation. Colorado State University: Fort Collins, CO.
- Duda et al (1999). The future of fishing in United States: assessment of needs to increase sport fishing participation. Report of Responsive Management to the International Association of Fish and Wildlife Agencies. Harrisonburg, Virginia.
- Duda et al., (2002). Attitudes of South Carolina youth towards aquatic resources and recreational fishing, Proceedings of the Fifty-Sixth Annual Conference of the Southeastern Association of Fish and Wildlife Agencies, 56, 421-433.
- Duda, M. D. & K. L. Brown. (1999). Hunters' and anglers' awareness of and attitudes toward wildlife in Texas. North American Wildlife and Natural Resources Conference Transactions 66:96-109
- Dustin, D.L., Bricker, K.S. & Schwab, K.A. (2010). People and nature: Toward an ecological model of health promotion. *Leisure Sciences*, 32(1), 3-4.
- Dwyer, J. F., & Barro, S.C. (2000). Outdoor recreation behaviors and preferences of urban racial/ethnic groups: An example from the Chicago area. Proceedings of the 2000 Northeastern Recreation Research Symposium. *USDA Forest Service General Technical Report Northeastern Forest Experimental Station*, 276, 159-164.
- Enck, J. W., Decker, D.J., & Brown, T.L. (2000). Status of Hunter Recruitment and Retention in the United States, *Wildlife Society Bulletin*, 28, (4), 817-824.
- Ewert, A. Place, G., & Sibthrop, J. (2005). Early-Life outdoor experiences and an individual's environmental attitudes. *Leisure Sciences*, 27, 225-239.
- Fedler, A. (2000). Participation in boating and fishing: a literature review. Report of Human Dimensions Consulting to the Recreational Boating and Fishing Foundation. Alexandria, Virginia.
- Felder, T. (2001). Fishing, Boating and Aquatic Stewardship Education: Framework and Best Practices Recommendations. In Felder (2001). Defining best practices in boating, fishing, and stewardship education, pp. 4-17. [Retrieved September 1, 2010 from http://idea.uwosh.edu/wcgprojects/phy_edNONONO/programs/adaptedpe/documents/bestpracticesboat.pdf]
- Fengler, J., & Schwarzer, C. (2008). Is there a self-concept change after participation in outdoor education programs? An evaluation study. *International Journal of Psychology*, 43 (3-4), 137-138.
- Flannery, K. & Whiting, R.M. (2003). Children's attitudes towards wildlife: A comparison of ethnicity and community size. Proceedings of the Annual Conference of Southeastern Fish and Wildlife Agencies, 57, 280-290.
- Flannery, K. E. C. (2001). Children's attitudes towards wildlife: A comparison by ethnicity and community size (Master's Thesis, Stephen F. Austin State University, 2001). *Masters Abstracts International*, 39, 759.
- Flowers, A.B. (2007). Assessing the effectiveness of a place-based conservation education program by applying utilization-focused evaluation. Unpublished Dissertation. The University of Montana: Missoula, MT. [From http://www.boone-crockett.org/pdf/LF_ABFDissertationFinalMay2007.pdf]
- Floyd, M.F. & Lee, I. (2002). Who buys fishing and hunting licenses in Texas? Results from a statewide household survey, *Human Dimensions of Wildlife*, 7:91-106.
- Gatzemann, T., Schweizer, K. & Hummel, A. (2008). Effectiveness of sports activities with an orientation on experiential education, adventure-based learning and outdoor-education, *Kinesiology*, 40(2),146-152.
- Godbey, G.C., Caldwell, L.L., Floyd, M., Payne, L.L. (2005). Contributions of leisure studies and recreation and park management research to give the active living agenda. *American Journal of Preventive Medicine*, 28(2S2), 150-158.

- Goldenberg, M. & Pronsolino, D. (2008). A means-end investigation of outcomes associated with Outward Bound and NOLS programs. *Journal of Experiential Education*, 30 (3), 271-276.
- Great Outdoors America: The Report of the Outdoor Resources Review Group, July 2009, http://www.orrgroup.org/documents/July2009_Great-Outdoors-America-report.pdf
- Hammitt, J.P. (1995). Responsible environmental behavior: metaphoric transference of minimum-impact ideology. Montana State University, MS thesis. 108 pp.
- Hartig, T., Kaiser, F.G. & Strumse, E. (2007). Psychological restoration in nature as a source of motivation for ecological behaviour, *Environmental Conservation*. 34(4), 291–299.
- Heberlein, T. A. & Thomson, E. (1997). The effects of hunter-education requirements on hunting participation and recruitment in the United States', *Human Dimensions of Wildlife*, 2: 1, 19 -31.
- Henderson K. A. & Bialeschki M. D. (2005). Leisure and Active Lifestyles: Research Reflections, *Leisure Sciences*, 27, 355–365.
- Hobbs-Viniuan, M (2006). School Is Back in Session, *Parks and Recreation*. September, 14-17.
- Holmes, R. (Ed.). (2007). *Reconnecting children through outdoor education*. Toronto, ON: Council of Outdoor Educators of Ontario.
- Holsman, R.H. (2000). Goodwill Hunting? Exploring the Role of Hunters as Ecosystem Stewards, *Wildlife Society Bulletin*, 28, (4), 808-816.
- Houghton, J.E., Thomas, C.L., Goodman, L., et al. (2001). Bridging the race and gender divides in forest recreation and private forest management through the becoming an outdoors-woman example. *Proceedings of the Society of American Foresters, 2001 national Convention*, 398-403. From http://nrs.fs.fed.us/pubs/gtr/gtr_ne302/gtr_ne302_102.pdf
- Hunt, K.M. & Ditton, R.B. (2001) Perceived benefits of recreational fishing to Hispanic-American and Anglo Anglers. *Human Dimensions of Wildlife*, 6, 153-172.
- Hunt, K.M. & Ditton, R.B. (2002). Freshwater fishing participation patterns of racial and ethnic groups in Texas, *North American Journal of Fisheries Management* 22, 52–65.
- ILI. (2010). American beliefs associated with encouraging children's nature experience opportunities Development and Application of the EC-NES Scale, Report for Children and Nature Network by Institute for Learning Innovation(ILI), Edgewater, MD. [From http://www.childrenandnature.org/downloads/EC-NES_Final_Report_2010.pdf]
- Kellert, S.R. (1998). A national study of outdoor wilderness experience. Unpublished report. New Haven, CT: Yale University. 104267 pp.
- Kelly, J.R., (1989). Recreation demand, aging, and the life course. *World Leisure & Recreation*, 31(3), 25-28.
- Klingman, B.A. (1991). The call of the wild: investigating the relationship between adventure education, character development, and the college curriculum. Unpublished Dissertation. The College of William and Mary, Williamsburg, Virginia.
- Leonard, J. (2007). Fishing and Hunting Recruitment and Retention in the U.S. from 1990 to 2005 Addendum to the 2001 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation, Report 2001-11. From http://library.fws.gov/pubs/nat_survey2001_recruitment.pdf
- Maller, C., Townsend, M., St. Leger, L., Henderson-Wilson, C., Pryor, A., Prosser, L., & Moore, M. (2008). The health benefits of contact with nature in a park context: A review of relevant literature. Deakin University and Parks Victoria. The original 2002 review and annotated bibliography are available online at: http://www.parkweb.vic.gov.au/1process_content.cfm?section=99&page=16 .
- Manfredo, M. J., & Teel, T. L. (2008). Integrating concepts: Demonstration of a multilevel model for exploring the rise of mutualism value orientations in post-industrial society (Chapter 8). In M. J. Manfredo, Who cares about wildlife: Social science concepts for understanding human-wildlife relationships and other conservation issues. New York: Springer Press.
- Manfredo, M. J., Teel, T. L., & Henry, K. L. (2009). Linking society and environment: A multilevel model of shifting wildlife value orientations in the western United States. *Social Science Quarterly*, 90, 407-427.

- Manfredo, M.J., Teel, T.L. & Bright, A.D. (2003). Why are public values toward wildlife changing? *Human Dimensions of Wildlife*, 8, 287-306.
- Marcinkowski, T. (2001). An overview of an issue and action instruction program for stewardship education, In Felder (2001). *Defining best practices in boating, fishing, and stewardship education*, pp. 98-128. Recreational Boating and Fishing Foundation, Retrieved September 1, 2010 from http://www.rbff.org/uploads/Resources_bestpractices/tommark_paper.pdf
- Matthews, B. E., & Riley, C. K. (1995). Teaching and evaluating outdoor ethics education programs. Vienna, VA: National Wildlife Federation. (ERIC Document Reproduction Service No. ED 401 097) [From <http://www.eric.ed.gov/PDFS/ED401097.pdf>]
- Mazze, S. (2006). *Beyond Wilderness: Outdoor education and the transfer of environmental ethics*, Unpublished Master's Thesis, University of Oregon.
- McCoy, C. (2010). Integrating information on wildlife values and barriers to participation in nature-based programs to improve agency efforts for connecting families to nature. Unpublished Thesis Master Thesis. Colorado State University, Fort Collins, CO., 2010.
- McGuire, F. A. & Dottavio, F.D. (1987). Outdoor participation across the lifespan – abandonment, continuity or liberation. *The International Journal of aging and human development*, 24(2), 87-100.
- McGuire, F. A., Dottavio, F.D., O'Leary, J.T. (1987). The relationship of early life experiences to later life leisure involvement. *Leisure Sciences*. 9(4), 251-257.
- McLeod, B., & Allen-Craig, S. A. (2004). An evaluation of an experiential learning and outdoor education school program on the life effectiveness skills of middle school boys. Retrieved June 22, 2010, from http://www.oeg.net.au/research/bibliography/mcLeod_allen-craig.pdf.
- McMullin S.L., Hockett, K.S., & McClafferty, J.A. (2007). Does angling or boating improve the stewardship ethic of participants? *American Fisheries Society Symposium*, 55, 145-155.
- Measells, M.K., Grado, S.C., Sun, C. & Belli, K.L. (2002). Evaluating Mississippi's Hunting and Fishing Licenses and Fees, Publication No. FO299 of the Forest and Wildlife Research Center, Mississippi State University. [<http://sofew.cfr.msstate.edu/papers/0509measells.pdf>]
- Miller, C.A. & Vaske, J.J. (2003). Individual and situational influences on declining hunter effort in Illinois *Human Dimensions of Wildlife*, 8, 263–276.
- Neill, J. T. (2002). *Outdoor education, ethics, and moral development*. Outdoor Education Research & Evaluation Center.
- Neill, J. T., & Dias, K. L. (2001). Adventure Education and Resilience: The Double-Edged Sword. *Journal of Adventure Education and Outdoor Learning*, 1(2), 35-42. [Retrieved from <http://wilderdom.com/JamesNeill/JamesNeillpublicationsPopular.htm>].
- Neill, J. T., Marsh, H. W., & Richards, G. E. (2003). The Life Effectiveness Questionnaire: Development and Psychometrics., *Sydney: University of Western Sydney*. [Retrieved from <http://wilderdom.com/JamesNeill/JamesNeillpublicationsPopular.htm>].
- Neill, J. T., & Richards, G. E. (1998). Does Outdoor Education Really Work? A summary of recent meta-analyses. *Australian Journal of Outdoor Education*, 3(1), 1-9. <http://www.wilderdom.com/abstracts/NeillRichards1998DoesOutdoorEducationReallyWorkSummaryMetaanalyses.htm>
- Neill, J.T. (1997). Outdoor Education in the Schools: What Can It Achieve? In *Catalysts for Change: 10th National Outdoor Education Conference Proceedings* Jan, 20-24, pp. 193-201. [Retrieved June 10, 2010 from <http://wilderdom.com/html/OutdoorEducationInSchoolsWhatCanItAchieve.html>].
- Neill, J.T. (2002). Meta-analytic Research on the Outcomes of Outdoor Education - Paper presented to 6th Biennial Coalition for Education in the Outdoors Research Symposium, Bradford Woods, IN, 2002, [Retrieved from <http://wilderdom.com/JamesNeill/JamesNeillpublicationsPopular.htm>].
- Nicol, K. (n.d.). Study shows fishing and boating as the #1 leisure activity for spending quality time with family." Alexandria, VA: American Sportfishing Association. From http://www.asafishing.org/content/newsroom/newspr_omni.cfm .

- NRPA (2008). Health Partnerships of Recreation and Park Organizations: Results from a Nationwide Study [From http://www.nrpa.org/uploadedFiles/Explore_Parks_and_Recreation/Research/Health%20Partnerships%20of%20Recreation%20Organizations.pdf]
- O'Connell, T.S. (2004). Multidimensional self-concept and outdoor adventure education with adolescents. *Research in Outdoor Education*, 6, 84-93.
- Paisley, K. (2004). *Research in outdoor education, volume 7: A peer-reviewed publication of scholarship first presented at the Coalition for Education in the Outdoors Sixth Biennial Research Symposium: January 9-11, 2002, Bradford Wood, Indiana / Cortland, N.Y.]* : Coalition for Education in the Outdoors.
- Penne, C. & Cushing, A. (2008). Utah's Community Fishing Program: Landing Partnerships in Fisheries Management and Education, *American Fisheries Society Symposium*, 67, 203-207.
- Peterson, M.N. et al. (2008). Evaluating household-level relationships between environmental views and outdoor recreation: The Teton Valley Case, *Leisure Sciences*, 30, 293-305.
- Pullis, G. (2000). Participation and expenditure patterns of African-American, Hispanic, and women hunters and anglers: Addendum to the 1996 National Survey of Fishing, Hunting and Wildlife-Associated Recreation (Report 96-6). Washington, DC: U. S. Fish and Wildlife Service, Division of Federal Aid, [From http://www.rbff.org/uploads/Research_section/USFWS_report.pdf]
- Racey, C.L., Clifton, J. & Coleman, C.L. (2008). Arkansas Game and Fish Commission's Family and Community Fishing Program, *American Fisheries Society Symposium*, 67, 247-253.
- Response Management. (2003a). Factors related to hunting and fishing participation among the nation's youth: Phase I Literature Review. Manuscript by Response Management Unit for USFWS. Retrieved 9/01/10 from <http://www.responsivemanagement.com/>.
- Response Management. (2003b). Factors related to hunting and fishing participation among the nation's youth: Phase V Final Report. Manuscript by Response Management Unit for USFWS. Retrieved 9/01/10 from <http://www.responsivemanagement.com/download/reports/FOF-dist.pdf>.
- Response Management. (2004). Issues Related to Hunting and Fishing Access in the United States: A Literature Review. Manuscript by Response Management Unit for USFWS. Retrieved 9/01/10 from http://www.responsivemanagement.com/download/reports/TRCA_Hunting_Fishing_Access_Lit_Review.pdf
- Responsive Management (2000a). Saving Lives and Preventing Boating-Related Accidents. Manuscript by Response Management Unit for the National Association of State Boating Law Administrators <http://www.responsivemanagement.com/download/reports/NASBLAsafety.pdf>
- Responsive Management. (2002b). Factors related to recreational boating participation in the US. A Review of Literature. Manuscript by Response Management Unit for NASBLA. Retrieved 9/01/10 from <http://www.responsivemanagement.com/download/reports/boatingliteraturereview-dist.pdf>.
- Responsive Management. (2010). Phase II: Registered boat owners' opinions on and attitudes toward boating safety education programs in 2008, Report for the National Association of State Boating Law Administrators, [From http://nasbla.org/files/NASBLA_2008_Phase_II_Survey_Report_Final-08-2010.pdf]
- Rickinson, M., Dillon, J., Teamey, K., Morris, M., Choi, M. Y., Sanders, D., et al. (2004). *A review of research on outdoor learning*. Shrewsbury, UK: Field Studies Council. http://www.field-studies-council.org/documents/general/NFER/A_review_of_research_on_outdoor_learning.pdf
- Riley, C.K. (1985). Missouri outdoor recreation skills program. Hunter education and more. *Transactions of the North American Wildlife and Natural Resources Conference*, p. 109-112.
- Roper Starch Worldwide (2002). Minority anglers and boaters: attitudes and participation in fishing, boating and resource stewardship (No. CNT547). Report to the Recreational Boating and Fishing Foundation. Roper Starch Worldwide, New York.
- Schroeder, S.A. , Fulton, D., Nemeth, M.L., Sigurdson, R.E., & Walsh, R.J. (2008). Fishing in the Neighborhood: Understanding Motivations and Constraints for Angling Among Minneapolis-St.

- Paul, Minnesota Metro Residents, *American Fisheries Society Symposium*, 67, 77-95. [Retrieved August 29, 2010 from http://files.dnr.state.mn.us/publications/fisheries/educational_reports/fin_understanding.pdf]
- Schroeder, S.A., Nemeth, M.L., Sigurdson, R.E. & Walsh, R.J. (2008). Untangling the line: Constraints to fishing participation in communities with color. *American Fisheries Society Symposium*, 67, 97-112.
- Schulz, J.H., Millspaugh, J.J., Zekor, D.T., & Washburn, B.E. (2003). Enhancing sport-hunting opportunities for urbanites. *Wildlife Society Bulletin*, 31, (2), 565-573.
- Selin, S., Hunt, F., Blanche, C., & Thompson, K. (2009). Outdoor recreation research and education for the 21st century: Defining national direction and building capacity. *Journal of Forestry*, October/November.
- Sibthorp, J., Furman, N., Paisley, K., & Gookin, J. (2008). Long-term impacts attributed to participation in adventure education: Preliminary findings from NOLS. *Research in Outdoor Education*, 9, 86-103.
- Sibthorp, J., Paisley, K., & Gookin, J. (2007). Exploring participant development through adventure-based programming: A model from the National Outdoor Leadership School. *Leisure Sciences*, 29, 1-18.
- Stafford, N., B. Bruyere, M. Davis, C. Ehlinger, S. Easterby, and A. Pitchford. Parents' Perceived Benefits and Fears about Experiences in Nature for Children. Unpublished Manuscript, Colorado State University. 2009.
- Taylor, D. (1989). The influence of an outdoor adventure recreation class on personality type, locus of control, self-esteem, and selected issues of identity development of college students. Unpublished Dissertation. University of San Francisco, CA.
- Thomas, J. (2005). On All Nine Legs: Teaching Outdoor Love to an Indoor World. *The Taproot: a publication of the Coalition for Education in the Outdoors*, 15(1), 4-6.
- Toth, J.F. & Brown, R.B. (1997). Racial and gender meanings of why people participate in recreational fishing. *Leisure Sciences*, 19, 129-146.
- USDHHS (2002). Physical activity and fitness: Improving health, fitness, and quality of life through daily physical activity. *Prevention Report*, U.S. Department of Health and Human Services, 16(4) [From <http://odphp.osophs.dhhs.gov/pubs/prevrpt/02Volume16/Iss4Vol16.pdf>]
- USFWS. (2006). National Survey of Fishing, Hunting, and Wildlife Associated Recreation, US Fish and Wildlife Service, from http://wsfrprograms.fws.gov/Subpages/NationalSurvey/2006_Survey.htm
- Wentz, J. & Seng, P. (2000). Meeting the challenge to increase participation in hunting and shooting, Newtown, CT. National Shooting Sports Foundation [From <http://6fbd21e64bc817fd097aa54148bd3dab37bc10ee.gripelements.com/documents/ttankfinal.pdf>]
- Woodhouse, J. (1987). Outdoor activities – establishing a lifelong friendship. *Bulletin of Physical Education*, 23(3), 9-13.
- Yerkes, R., & Haras, K. (1997). Outdoor education and environmental responsibility. ERIC Digest. [From <http://www.ericdigests.org/1998-2/outdoor.htm>]
- Zwick, R., Flaherty, J., Solan, D., Tisa, M., & Langlois, S. (2005). Perceived opportunities and constraints on participation in a Massachusetts youth hunt. *Proceedings of the 2005 Northeastern Recreation Research Symposium GTR-NE-341*, 254-261. [From http://www.fs.fed.us/ne/newtown_square/publications/technical_reports/pdfs/2006/341%20papers/zwick341.pdf]

Additional Sources

Balmford, A., Clegg, L., Coulson, T. & Taylor, J. (2002). Why Conservationists Should Heed Pokémon, Andrew Balmford, Lizzie Clegg, Tim Coulson, and Jennie Taylor (29 March 2002) *Science* **295** (5564), 2367b. [DOI: 10.1126/science.295.5564.2367b]
<http://www.sciencemag.org/cgi/content/full/sci;295/5564/2367b>

Boone and Crockett Club <http://www.boone-crockett.org/index.asp>

Boy Scouts of America – illustration of partnerships for environmental stewardship

- The Boy Scouts of America Receives \$100,000 Centennial Grant from the UPS Foundation
<http://www.scouting.org/Media/PressReleases/2010/20100901.aspx>
- Recreational Boating & Fishing Foundation and the Boy Scouts of America Sign Memorandum of Mutual Support, <http://rbff.mediaroom.com/index.php?s=43&item=240>

Centers for Disease Control and Prevention. (2010) *The association between school based physical activity, including physical education, and academic performance*. Atlanta, GA: U.S. Department of Health and Human Services. From
http://www.cdc.gov/healthyyouth/health_and_academics/pdf/pa-pe_paper.pdf

Dickson, T.J. Gray, T. & Mann, K. (2008). Australian Outdoor Adventure Activity Benefits Catalogue, University of Canberra, Australia,
<http://www.oric.org.au/IndustryNews/OutdoorActivityBenefitsCatalogueFinal270808.pdf>

Environmental Stewardship <http://environmental-stewardship.org/default.aspx>

Fishing and Hunting Recruitment and Retention in the U.S. from 1990 to 2005, Addendum to the 2001 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation, Report 2001-11. From http://library.fws.gov/pubs/nat_survey2001_recruitment.pdf

Girl Scouts of America

Linking Girls to the Land,

http://www.girlscouts.org/program/program_opportunities/environment/linking_girls_to_the_land.asp

Responsive Management, www.responsivemanagement.com

Trout Unlimited <http://www.tu.org/about-us/youth-education-and-outreach/first-cast-program>

Industry reports, websites and related documents

American Institutes for Research (2005). Effects of outdoor education programs for children in California see http://www.air.org/reports-products/index.cfm?fa=viewContent&content_id=644.

Missouri Department of Conservation <http://www.hunter-ed.com/mo/index.htm?gclid=CMrS4JPal6MCFRKeDAodTh-coA>

Missouri Hunter Education <http://www.hunter-ed.com/mo/index.htm?gclid=CMrS4JPal6MCFRKeDAodTh-coA>

National Recreation and Park Association www.nrpa.org

- Health Partnerships of Recreation and Park Organizations: [Results from a Nationwide Study](#)

Great Outdoors America, <http://www.orrgroup.org/>

- The Report of the Outdoor Resources Review Group, July 2009, http://www.orrgroup.org/documents/July2009_Great-Outdoors-America-report.pdf

National Association of State Boating Law Administrators, www.nasbla.org

Outdoor Industry Association (OIA), <http://www.outdoorindustry.org/>

- OIA provides recent research on outdoor recreation participation: see http://www.outdoorindustry.org/research.php#participation_studies
 - Outdoor Recreation Participation Report, 2009
 - A Special Report on Camping
 - A Special Report on Fishing and Boating
 - Outdoor Recreation Participation Topline Report, 2009
 - The Next Generation of Outdoor Participants Report
 - 2010 Special Report on Fishing and Boating
 - A Special Report on Youth

Lt. Governor Barbara O'Brien's Colorado Kids Outdoors Initiative. Report by The Office of Lt. Governor Barbara O'Brien and Wendy Newman, January, 2010. [Retrieved from http://www.aspenpitkin.com/Portals/0/docs/county/OpenSpace/publicpackets/LtGov's_CKO_Initiative_Report.pdf]

Thesis and dissertation work on positive impacts of outdoor education

- A case study of social capital and collaboration as a communication process in an urban community-based ecological restoration project / Cara Marie DiEnno Dissertation (Ph. D.) – Colorado State University, CO.
- A meta-analytic study of the effects of therapeutic adventure programming on a mental health population of children and adolescents / Eric Craig Powell, Thesis (Psy. D.)--University of Northern Colorado, 2003.
- A quantitative and qualitative investigation of the effects of adventure education on high school students / Jeffrey S Gehri, Thesis (Ph. D.)--Temple University, 2007.
- Beyond Wilderness: Outdoor education and the transfer of environmental ethics / Sarah Mazze, Thesis (M.S.)—University of Oregon, 2006.
- Ego and self-concept development among juvenile delinquent participants in adventure-based programming / Paula Lindsay Sale. Thesis (Ed. D.)--Peabody College for Teachers of Vanderbilt University, 1992.
- Instrument validation and multivariate assessment of life skill development in adolescents through the adventure education process / R James Sibthorp, Thesis (Ph. D.)--Indiana University, 2000.
- Motivational levels of school-aged children after participation in an outdoor education experience / Timothy Eugene Speicher, Thesis (M.S.)--Marshall University, 1998.
- The call of the wild: investigating the relationship between adventure education, character development, and the college curriculum. Barbara A. Klingman, Dissertation (Ph.D.)—The College of William and Mary, Virginia, 1991.

- The effect of participation in an outdoor experiential education program on self- concepts / by Daniel Lewis McDonald. Thesis (Ed. D.)--Oklahoma State University, 1983.
- The effects of a Ropes Course Program on adolescent self-esteem, self-efficacy, coping skills and academic performance / Timothy M Trainor 1998, Thesis (M.S.)--Central Washington University
- The effects of adventure education on the locus of control of middle school and high school at-risk students / Melanie Stevens, Thesis (M.S.)--University of Wisconsin -- La Crosse, 2005.
- The influence of an outdoor adventure recreation class on personality type, locus of control, self-esteem, and selected issues of identity development of college students / by Don Taylor. Thesis (Ed. D.)--University of San Francisco, 1989.
- The relationship between early participation in an outdoor education program and retention in an academic unit / Mark G Urte, lThesis (Ed. D.)--Indiana University, 2003.
- The therapeutic effects of outward bound with juvenile offenders / Robin Boudette. Thesis (Ph.D.)--California School of Professional Psychology, 1989.

APPENDIX A: Benefits of Outdoor Adventure

Table 1 Benefits of Outdoor Adventure (Darst & Armstrong, 1980)

Dimension	Benefit
Personal	New experience – adds a kick to participants' lives, allows them to experience something
	High-risk experience – facing perceived danger may help participants overcome fears, gain self-confidence, and enhance their ability to cope
	Escape – offers release from the tensions and complexities of modern life
	Success – allows participants to achieve a highly personal sense of accomplishment
Economic	Knowledge – participants learn more about themselves and the environment
	Physical fitness – physical activity can help burn calories and increase strength, stamina, and flexibility
Social-psychological	Minimal financial investment – provides interesting and pleasant activities at a reasonable cost
	Socializing – provides a chance to meet others who have similar interests
	Unity – promotes cohesiveness and doing things together without the distractions of everyday life
	Cooperation and trust – promotes better relationships through cooperation, appreciation of others, compassion and respect
	Nature and outdoors – promotes aesthetics appreciation for nature and concern for vanishing wild places

Table 2 Benefits of Outdoor Adventure (Ewert, 1989)

Dimension	Benefit
Psychological	Benefits on a personal (versus group) basis: Self concept (enhanced or strengthened view), self-efficacy (self-confidence), self-actualisation (well-being, improved self-expression, feelings of psychological health)
Sociological	Compassion, cooperation, respect for others, communication
Educational	Improved academic abilities, awareness of nature and the environment, problem solving, outdoor skills, values clarification
Physical	Strength, co-ordination, balance, cardiovascular endurance

Table 3 Goals and Benefits of Outdoor Adventure (Webb, 1999)

Dimension	Benefit
Recreational	Enjoyment, relaxation, entertainment, excitement, catharsis, self-expression
Skill	Goal setting, decision making, problem solving, responsibility, physical development, nature awareness, communication, leadership
Character	Independence, interdependence, self-efficacy, willingness to take risks, tolerance, respect, trust, compassion

Table 4 Benefits of Camping (American Camp Association, 2005)

Dimension	Benefit
Positive identity	To the participant: e.g. self-esteem, determination, dependability, ambition, independence
Social skills	Beyond the individual: group bonding, cooperation, conflict resolution, appreciation of differences, leadership, community, connected to others
Physical and thinking skills	Activity skills, psychomotor and technical skills; physiological benefits of physical activity Thinking skills: knowledge of safety measures, planning, problem solving, environmental awareness
Positive values and spirituality	Acquiring and strengthening virtue: selflessness, compassion, keeping commitments, fulfilling obligations, self-discipline, honesty ... Connection to earth, others and even a higher power

Source. Australian Outdoor Adventure Activity Benefits Catalogue, University of Canberra, Australia, p. 3, [From <http://www.oric.org.au/IndustryNews/OutdoorActivityBenefitsCatalogueFinal270808.pdf>]

APPENDIX B: Ideas for the future

IDEAS FOR THE FUTURE: HOW WE CAN TRANSFORM OUR COMMUNITIES

There is no “one right way” to participate in the movement to reconnect children and nature. There are a variety of approaches. Even so, there are some “lessons learned,” best practices and approaches that tend to be more successful than others. And new ideas are being tried or proposed.

- **Face the fear.** In most neighborhoods, the perception of stranger danger is greater than the reality. The movement can help parents and other caregivers to teach children to watch for behaviors, not necessarily strangers. According to family psychologist John Rosemond, “telling a child to stay away from strangers is relatively ineffective. ‘Stranger’ is not a concept young children understand easily. Instead, children ought to be taught to be on the lookout for specific threatening behaviors and situations.” This view is supported by the U.S. Department of Justice.
- **Support and expand Scouting organizations, 4-H and other traditional programs—** particularly when they create new efforts to connect children with nature. For example, in 2006, Camp Fire USA, Central Ohio Council, launched “Vision 20/10: Reuniting Children and Nature” to bring “10,000 kids into the woods by 2010.”
- **Support local nature centers and nature preserves.** Help get children involved in wildlife habitat restoration programs. Habitat restoration helps children associate nature with the restorative quality of nature work. Those working in botanical gardens, zoos, natural history museums and children’s museums: Become convening centers for regional children and nature campaigns, in addition to taking direct action.
- **Green your city.** Push for better urban planning in developing and redeveloping areas, including tree planting, more natural parks, walkable neighborhoods and public transportation so that urban children and families can easily reach nature areas. Developers and builders: Create green communities, or better yet, redevelop decaying neighborhoods with green oases that connect children and adults to nature.
- **In your neighborhood or development, challenge conventional covenants and restrictions** that discourage or prohibit natural play. Rewrite the rules to encourage it. Allow kids to build forts and tree houses or plant gardens. Make sure they have access to nearby nature.
- **Naturalize old and new urban parks.** During the last two decades, natural-play-area designers have become skilled at creating living landscapes for parks with high foot traffic. Such natural play areas can be distributed throughout every city. Reinvent the vacant lot. Developers often leave set-aside land — slices of property not large enough to be playing fields, not conveniently enough located to be pocket parks, but just fine as islands of wildness. These and other urban and suburban plots can be transformed into “wild zones” or adventure playgrounds. Work with conservancy groups to establish what might be called “nearby-nature trusts.”
- **In your community, promote the annual Take Your Child Outside Week** (see <http://www.takeachildoutside.org/>) every week.



- Break down the silos: promote dialogue among people from different ethnic cultures, as well as those individuals who work separately and speak different professional languages, such as pediatricians and landscape architects; public health professionals and park and recreation officials; bike and pedestrian advocates; and arborists, hunters, anglers, residential developers and environmentalists. Engage faith-based communities.
- Join C&NN's Nature Clubs for Families initiative, with sponsoring support from REI, designed to inspire and support families to come together outdoors for everyone's health and well-being. See *C&NN's Nature Clubs for Families Tool Kit: Do It Yourself! Do It Now*. This resource is a friendly tool with ideas, anecdotes and resources for planning fun and healthy family outings with other families in your community—once a week, once a month, and in all the seasons.

WHAT CONSERVATION GROUPS CAN DO

The movement can build on the growing desire of conservation organizations to expand their focus from pollution and other negative impacts of humans, to the restorative qualities of nature for children and adults. By focusing more on the health imperative, particularly the health and well-being of children, they can build their base and effectiveness.

- Reach out to traditionally underserved populations, in order to reach parents and children, in inner-cities, areas of rural poverty, and other areas. For example, in April 2007, the Sierra Club, working with the National Military Family Association, announced Operation Purple, which offers free summer camps to thousands of children of deployed military families. Some nature conservancy organizations are going beyond their traditional definition of conservation.
- Step into new arenas. A new environmental marketing organization, integral to this report, is ecoAmerica, and it is targeting children and nature, in part, as a way to expand the current membership base (which is both aging and shrinking). As mentioned earlier, the Conservation Fund, in an effort to develop a constituency for this issue beyond traditional conservation circles, extended its role beyond nature preservation to create the National Forum on Children and Nature, enlisting governors, mayors, cabinet secretaries, corporate CEOs and non-government organizations to help raise national awareness about the problems facing our children, and to help place in the spotlight the role that nature can play in addressing those problems. These people and organizations realize that the human child in nature may also be an endangered species—and the most important indicator of future sustainability.
- Connect with the land. The children and nature issue can also provide added political reach and effectiveness to efforts to protect natural habitats now and in the future. The Trust for Public Land is placing increased emphasis on engaging children with nature, to ensure that natural areas preserved today will continue to be protected by future generations. For example, proponents of a new San Diego Regional Canyonlands Park, which would protect the city's unique web of urban canyons, have adjusted their efforts to address these younger constituents. "In addition to the other arguments to do this, such as protecting wildlife," says Eric Bowlby, Sierra Club Canyons Campaign coordinator, "we've been talking about the health and educational benefits of these canyons to kids. People who may not care about endangered species do care about their kids' health." For conservationists, it

could be a small step from initiatives like these to the idea of dedicating a portion of any proposed open space to children and families in the surrounding area. The acreage could include nature centers, which ideally would provide outdoor-oriented preschools and other offerings.

- Focus on the present and the future. Also, as part of this movement, conservation organizations could help create a new generation of leadership by engaging young people who would become leaders by first being immersed—and helping other young people become engaged—in direct, nature experience. In this way, a new constituency for the environment would be nurtured, one that would be rooted in a personal experience in nature, rather than in only an abstract, intellectualized relationship. With this in mind, the Sierra Club and the Children & Nature Network have created and launched the “Natural Leaders Network™,” with founding partners, the Sierra Club and The North Face.

WHAT EDUCATORS CAN DO

Some educators see that the Leave No Child Inside movement could become one of the best ways to challenge other entrenched concepts—for example, the current, test-centric definition of education reform. Research shows schools that use outdoor classrooms, among other techniques, produce student gains in test scores and grade-point averages; and enhanced skills in problem-solving, critical thinking and decision-making. In addition, time in natural surroundings stimulates children’s creativity—and reduces teacher burnout. As the movement progresses, it can encourage educators, as well as students, to:

- Support educators that are currently, against great odds, sponsoring nature clubs, nature classroom activities, and nature field trips. Engage them also as participants in the movement.
- Support existing and new nature-themed schools, such as the Schlitz Audubon Nature Center Preschool, where, as the *Milwaukee Journal Sentinel* reported in April 2006, “a 3-year-old can identify a cedar tree and a maple—even if she can’t tell you what color pants she’s wearing. And a 4-year-old can tell the difference between squirrel and rabbit tracks—even if he can’t yet read any of the writing on a map. Young children learn through the sounds, scents, and seasons of the outdoors.” Taking cues from the preschool’s success in engaging children, an increasing number of nature centers are looking to add preschool programs not only to meet the demand for early childhood education but also to “create outdoor enthusiasts at a young age,” the *Journal Sentinel* reported. And their success points to a doorway to the larger challenge—to better care for the health of the Earth.
- Green the schoolyards and the K-12 curricula: The U.S. Fish and Wildlife Service’s Schoolyard Habitat program offers one way to do this. They can also tap the many available resources to help, including Project Learning Tree and Project WILD, which tie nature-based concepts to all major school subjects, requirements and skill areas.
- Work for reform of the No Child Left Behind Act, at the national, state and local levels. Support environmental education in the classroom and outdoor experiential learning outside the school.



- Follow Norway’s lead, and establish farms and ranches as “the new schoolyards,” and thereby create a new source of income for farm culture, teach kids about the sources of their food, and give them hands-on, practical experience that will provide lasting benefit.
- Return natural history to higher education. Work to require universities to teach the fundamentals of natural history, which have been eliminated from the curricula of many research universities. Also, fund more research on topics involving the relationship between children and nature, and engage students in that research. Place greater emphasis on conservation as a career path. Conservation organizations are experiencing a “brain drain” as baby boomers continue to retire; this presents career opportunities that students may not have considered. Students can also be encouraged to make the children and nature issue part of their chosen path in any profession, such as teaching or urban design.
- Spread the word: offer presentations to school boards, parent-teacher associations and similar groups, making the case for the educational benefits of nature experience for children and young people.
- Join C&NN’s new Natural Teachers Network™, designed to support, encourage and inspire all teachers to open the door to the first classroom, the natural world.

WHAT BUSINESSES, THE LEGAL PROFESSION, AND HEALTH CARE PROVIDERS CAN DO

Farsighted members of the business community are awakening to the link between this issue and future economic health; they can become central partners in the movement.

- Engage the outdoor industry as conveners and financial sponsors of the movement. The Outdoor Industry Association (OIA), which represents hundreds of companies selling everything from backpacks to kayaks, reports good sales of upscale products—and now realizes that sales of traditional entry-level gear are nearly dead in the water. Discouraged by the trend, some companies have dropped their entry-level product lines. The rapid increase in child inactivity and obesity has “sent a big message to the industry that we need to do something to reverse this trend,” according to Michelle Barnes, OIA’s vice president for marketing. In Canada, the Mountain Equipment Co-op, with several million members, is considering a proposal to provide free rentals of outdoor equipment to children across Canada.
- Challenge developers. Some are already attracted to the movement as a source of new ideas for new markets. The *Sacramento Bee* reported in July 2006 that Sacramento’s biggest developer, Angelo Tsakopoulos and his daughter Eleni Tsakopoulos-Kounalakis, who together run AKT Development, “have become enthusiastic promoters” of *Last Child in the Woods*, which they say has inspired them to pursue new designs for residential development that will connect children and families to nature. Rather than excusing more sprawl with a green patina, the movement could encourage the green redevelopment of portions of strip-mall America into Dutch-style eco-communities, where nature would be an essential strand in the fabric of the urban neighborhood. There is increasing attention within the architecture, engineering, planning and development communities on incorporating both green engineering and principles of biophilic design into what Yale scholar, Stephen Kellert, calls “restorative environmental design.”

- Engage the business community. In general, the business community can be asked to support regional and national campaigns to connect children to nature. They can help their communities in more targeted efforts, such as funding bus services for under-budgeted school field trips. They can sponsor outdoor classrooms for schools. They can underwrite nature centers and nature programs for vulnerable children, and join with land trust organizations to protect open space—and build family nature centers on that land. Businesses can also become financial sponsors of non-profit groups that work directly to connect children and parents to nature.
- Bring families to business and business to families. For their own employees, businesses can sponsor on-site nature-based child-care centers, as well as nature retreats for employees and their families. Businesses can also help to fund research, e.g., to gather knowledge on how best to create child/nature friendly homes and neighborhoods. Such research could focus on the relationship between nature experience and worker productivity, health, reduced absenteeism, and so forth.
- Challenge the legal profession. Through public education and changes in the justice system, the legal industry can promote the concept of comparative risk as a legal and social standard. Yes, there are risks outside our homes. But there are also risks in raising children under virtual protective house arrest: threats to their independent judgment and value of place, to their ability to feel awe and wonder, to their sense of stewardship for the Earth—and, most immediately, threats to their psychological and physical health. The legal profession could create public risk commissions to examine areas of our lives that have been radically changed by litigation, including the experience of nature. It could also create a Leave No Child Inside Legal Defense Fund nationally or in your community. With contributions from the legal profession and other interested parties, establish a fund that would, using *pro bono* attorneys, help families and organizations fight egregious lawsuits restricting children's play in nature, and bring media attention to the issues.
- Encourage health care providers to establish children's contact with nature as a leading public health issue. Howard Frumkin, director of the National Center for Environmental Health, points out that future research about the positive health effects of nature should be conducted in collaboration with architects, urban planners, park designers, and landscape architects. "Perhaps we will advise patients to take a few days in the country, to spend time gardening," he wrote in a 2001 American Journal of Preventive Medicine article, "or [we will] build hospitals in scenic locations, or plant gardens in rehabilitation centers. Perhaps the . . . organizations that pay for health care will come to fund such interventions, especially if they prove to rival pharmaceuticals in cost and efficacy."
- Advocate for free, nature-based outdoor play. In the debate over child obesity and other health problems associated with a sedentary lifestyle, health care researchers, practitioners and public health officials should place as much emphasis on free outdoor play, especially in natural surroundings, as they now place on children's organized sports. At the national level, health-care associations should support nature therapy as an addition to the traditional approaches to attention-deficit disorders and childhood depression. In 2007, Mind (National Association for Mental Health), the leading mental-health charity in Great Britain, advised the use of "green therapy"—from gardening to walking in the countryside—instead of relying solely on pharmaceuticals to treat depression and anxiety.



- Nationally or regionally, create a “Grow Outside!” campaign. Pediatricians and other health professionals could use office posters, pamphlets, and personal persuasion to promote the physical and mental health benefits of nature play. This effort might be modeled on the national physical-fitness campaign launched by President John F. Kennedy. They could call the campaign “Grow Outside!” A similar approach, “Green Check Ups,” is proposed by the National Wildlife Federation: “State Health and Natural Resource Departments can follow the lead of the American Academy of Pediatrics and ask doctors to recommend regular outdoor time as part of a wellness check for children.”

WHAT GOVERNMENT CAN DO

Government has a unique opportunity in coming years. It cannot reverse the nature deficit alone—nor does it have to. But it can be a stronger partner with the public movement. Government, with its influence over parks, open space and how we shape cities, education and health care, has a crucial role to play.

- **Governors and mayors:** Help launch Leave No Child Inside campaigns in your states and cities; support regional, state and national efforts. Support your own versions of the Children’s Outdoor Bill of Rights, as signed by Gov. Arnold Schwarzenegger in 2007, and proclaimed by Maryland Gov. Martin O’Malley in 2009.
- **Expand or replicate successful state and national programs,** from Texas’ “Life is Better Outside” campaign to Connecticut’s “No Child Left Inside” program to get families into underused state parks. In 2006, under the leadership of Governor Rell and Gina McCarthy, Connecticut’s Commissioner of Environmental Protection who is now in a senior role with the Obama administration, that state launched a pioneering program to encourage families to use the underutilized state parks. Replicable in every state, McCarthy’s effort was the first formal program to call itself No Child Left Inside. Nisqually National Wildlife Refuge in Washington State successfully brings hundreds of schoolchildren to the Refuge and combines school lessons with tree plantings for habitat restoration. These efforts connect children to nature and give them a sense of hope and personal responsibility. In a similar move, the U.S. Forest Service has launched More Kids in the Woods, which funds local efforts to get children outdoors. The State of New Mexico is looking at how farms and ranches can become the new schoolyards, and in 2008, Kansas State Parks Director Jerry Hover joined with others to adopt the Kansas Children’s Outdoor Bill of Rights.
- **Local and regional government executives:** Review zoning barriers to nature; support environmental and outdoor education in municipal and state parks and recreation centers; convene meetings of developers, health and childhood experts, landscape architects, and outdoor play experts to review future development and redevelopment policies. View the nature-human connection as a public health and education issue, and support public investments in research to deepen our understanding of the issue and its practical applications.
- **Establish ways to measure the economic importance of nature,** including but going beyond traditional measures of recreational activities (fishing, hunting, boating, hiking), and also beyond concern about the negative impacts of environmental toxins, to include the positive economic impact on the public’s mental and physical health, education, and jobs, existing and potential. Working with researchers, civic organizations and advocacy groups,

establish baseline measurements of the nature deficit, so that progress can be measured and reported. Include annual progress measurements in new or existing reports on children's health and educational status.

- Support policies that increase the supply of naturalists and interpreters at our parks and other public nature settings. These professionals will become even more important as children experience less nature in their own neighborhoods. Government conservation agencies could also build a strong national conservation corps to actively recruit young people from diverse backgrounds into the conservation professions. At the federal and state levels, park systems could replicate Connecticut's "No Child Left Inside" program, which has so successfully repopulated that state's parks with families—or establish innovative nature attractions, such as the simple "canopy walk" created by biologist Meg Lowman in Florida, which doubled the attendance of one state park. In June 2009, Interior Secretary Ken Salazar established an Office of Youth in National Resources at the Department of the Interior, saying "this summer alone we will have 15,000 young people from all walks of life who will be part of the work of the department." In addition, the Association of Fish and Wildlife Agencies presented recommendations to President Obama before he was sworn into office that listed children and nature as No. 2 in their roster of five Priorities of a National Agenda for State Fish and Wildlife Agencies.
- Educators: Future education reform should return nature to our schools by encouraging field trips, natural playgrounds, outdoor classrooms, and broad support for outdoor and environmental education. They can support outdoor education and recreation grant programs for underserved children, and more funds for classroom environmental education and outdoor education.
- Legislators: Introduce bills to establish nature education partnerships among parks and schools, educators and farmers. And they can support policies that strengthen land trust law, keep farming families on their land, and decrease property owners' liability when they allow children to play on open land. Federal and state conservation agencies can loosen current restrictions of the use of government funds for outreach efforts. "Here we sit with the mandate of managing the resource for future generations," one state official said recently. "The legislature wants us to manage habitat and wildlife but minimizes support for the other, critical half of the equation, managing the people surrounding and influencing that habitat."
- Build collaborations between the Departments of Interior, Education, Agriculture, and Health and Human Services that focus on children and nature, a challenge that affects them all, and can best be addressed through multiple disciplines.
- Encourage and work with a national Leave No Child Inside movement. By doing so, government agencies can seek philanthropic partners beyond traditional government sources of conservation dollars; for example, foundations concerned about child obesity, education philanthropies promoting experiential learning, or civic organizations that see the link between land and community.



APPENDIX C: Efforts in the U.S. to Connect Youth to the Outdoors

APPENDIX C: REGIONAL AND STATEWIDE EFFORTS IN THE U.S. TO CONNECT YOUTH TO THE OUTDOORS¹

Americans are becoming more aware of the serious implications of the disconnect between youth and families and the outdoors, as evidenced by the multitude of programs undertaken in many states (Table 1). Within multiple states, there are several regional groups working collaboratively on the issue, as well. Every campaign has been designed with consideration of the unique needs, attitudes, and landscapes of each state.

Several of the components of *Lt. Governor Barbara O'Brien's Colorado Kids Outdoors Initiative* were adapted from successful programs in other states.

Table 1: Regional and Statewide Efforts to Connect Youth to the Outdoors

STATE	CITY/AREA	CAMPAIGN NAME	CAMPAIGN DESCRIPTION	CONTACT/WEBSITE
Alaska	Anchorage	Get Outdoors Anchorage	Get Outdoors Anchorage" is a collaborative effort of agencies, organizations, and individuals who seek to reconnect Alaskans' with forests, parks and other public lands.	WedemeierAM@muni.org
Arizona	Phoenix	Be Outdoors Az		williamson@thephxzoo.com
Arkansas	Little Rock	Regional Campaign		Kyla_Hastie@fws.gov
California	Sacramento	California Children's Outdoor Bill of Rights	That every child in California, by the completion of their 14th year, have the opportunity to experience each of the activities listed within the California Children's Outdoor Bill of Rights.	www.calroundtable.org/cobor.htm
California	Northern	Children in Nature Collaborative	The Children in Nature Collaborative was initiated in 2007 with the goal of engaging individuals and organizations from all sectors in this issue. The Collaborative is made up of regional and national partners — teachers, parents, farmers, health professionals, environmentalists, businesses, faith-based groups and community leaders.	www.cincbyarea.org

¹ Heirshberg, Marc S. "Connecting Colorado's Kids with Nature." Thesis. Regis University, 2009. Print.

STATE	CITY/AREA	CAMPAIGN NAME	CAMPAIGN DESCRIPTION	CONTACT/WEBSITE
California	Santa Barbara	Leave No Child Inside Santa Barbara	LNCI Santa Barbara is sponsoring a collaborative web site offering resources, information, and programs to encourage parents to unplug their kids and go outside.	www.santabarbarawild.org
California	Los Angeles	Regional Campaign		bill.vandenberg@ca.rr.com
California	San Diego	San Diego Canyon lands	San Diego Canyon lands are working to protect and restore San Diego area canyons to make them available to grade-school educational programs and high-school volunteers.	http://sdcanyonlands.org
California	Santa Barbara	Santa Barbara Wild: A Leave No Child Inside Coalition	A regional collaboration of organizations, institutions and individuals dedicated to reconnecting children to nature.	Imoffat@SBNATURE2.ORG
Colorado	Statewide	Lt. Governor Barbara O'Brien's Colorado Kids Outdoors Initiative	A statewide initiative with several components to raise awareness about the issue and address the epidemic. Includes the development of a Kids' Outdoor Bill of Rights, 11-stop statewide tour, report on the public forums, and a toolkit for communities.	www.colorado.gov/LtGovernor
Colorado	Statewide/ Denver Metro	Colorado Kids Outdoors Coalition	Colorado Kids Outdoors is a collaboration among organizations in the public, private and nonprofit sectors for whom the shared goal is increasing outdoor activity for children.	www.coloradokidsoutdoors.org

STATE	CITY/AREA	CAMPAIGN NAME	CAMPAIGN DESCRIPTION	CONTACT/WEBSITE
Colorado	Fort Collins and surrounding areas	Children and Nature Connection - Northern Colorado	This collaborative effort of 20 local agencies and organizations has focused on community outreach to raise awareness and encourage parents to take kids outside. Public presentations, book study classes for teachers, and booth at local events have been used to spread the word. Agencies and organizations are modifying their youth outreach programs to include unstructured play time.	bhale.cnc@gmail.com
Connecticut	Hartford	No Child Left Inside	Introduced in 2005 by Governor M. Jodi Rell, and coordinated by the CT Department of Environmental Protection, No Child Left Inside, a major state initiative, is designed to reconnect families with the outdoors, build the next generation of environmental stewards and showcase Connecticut state parks and forests.	www.nochildleftinside.org
Florida	Tallahassee	Get Outdoors Florida!	Our mission is: "Engaging communities, families and individuals in outdoor experiences to achieve healthier lifestyles and sustain Florida's natural resources." We include government, university, not-for-profit, and commercial partners in this grass roots initiative.	www.getoutdoorsflorida.com
Florida	Sarasota	Regional Campaign		Canopyme@aol.com
Georgia	Atlanta	Get Outdoors Georgia	The DNR-PRHSD developed the Get Outdoors Georgia (GO Georgia) program to promote youth and family-friendly nature-based and health-focused activities throughout the state.	www.GeorgiaStateParks.org
Idaho	Boise	"Be Outside" - Idaho Children and Nature Network	The Idaho Children and Nature Network is a group of Idaho city, state and federal agencies, nongovernmental organizations, private business owners and citizens united in the common cause of empowering all Idahoans to lead healthy lives by developing a sense of place in Idaho's outdoors.	www.beoutsidaidaho.org

STATE	CITY/AREA	CAMPAIGN NAME	CAMPAIGN DESCRIPTION	CONTACT/WEBSITE
Illinois	Chicago	Leave No Child Inside: Explore Chicago Wilderness	The Chicago Wilderness Leave No Child Inside initiative is an effort to promote children's health and foster generations of kids who care about nature enough to care about it in the future.	www.kidsoutside.info/
Illinois	Deer Park	LNCI for the Greater Barrington, Deer Park and Lake Zurich Area	The LNCI Consortium, a large group of representatives from major community sectors of the greater Barrington, Deer Park and Lake Zurich area have started a local LNCI initiative. Involved are representatives of these communities' education, health care, government, business, faith-based, conservation, and non-profit sectors.	http://funoutside.org
Indiana	Indianapolis	Regional Campaign		wgartner@dnr.IN.go
Kansas	Wichita	g2g Outside	g2g Outside is a developing program of Sedgwick County Extension in partnership with other community partners in the Wichita, KS area. We are developing this program to encourage children and families to spend more time doing outdoor activities, particularly unstructured activities.	http://g2goutside.wordpress.com/
Kentucky	Murray	Regional Campaign		Joe.baust@coc.murraystate.edu
Maine	Revere	Take it Outside	Take it Outside is an initiative led by Governor John E. Baldacci to encourage Maine's children and families to reconnect with nature. Take it Outside! is your one-stop shopping information source for year-round outdoor recreation opportunities in Maine. Here you will find everything you need to Take it Outside! and have fun in the great Maine outdoors	www.take-it-outside.com
Maryland	Baltimore	Leave No Child Inside	The Greater Baltimore Children & Nature Collaborative (GBCAN) encourages partnerships and provides information to foster caring connections with nature.	www.gbcan.org

STATE	CITY/AREA	CAMPAIGN NAME	CAMPAIGN DESCRIPTION	CONTACT/WEBSITE
Maryland	Statewide	Maryland Partnership for Children in Nature	On April 21, 2009 Governor O'Malley received the draft Maryland Partnership for Children in Nature Plan. The plan outlines Maryland initiatives that will take place within the school curriculum as well as enhancing opportunities for getting families and children connected with nature	www.dnr.state.md.us/education/children_nature/
Massachusetts	Boston	Regional Campaign		gvcardoza@massaudubon.org
Michigan	Holland	Connecting Children & Nature		twilliam@oaisd.org
Michigan	Harbor Springs	Getting Kids Outdoors: Emmet County	To build a community that embraces and promotes getting kids outdoors as part of a healthy lifestyle.	www.gettingkidsoutdoors.org
Michigan	Kalamazoo and Southwest	Leave No Child Inside		JWright@naturecenter.org
Michigan	Ann Arbor	Michigan No Child Left Inside Coalition	It is our belief that all children in Michigan should have access and opportunity to safely enjoy Michigan's outdoor heritage. The members of the Michigan No Child Left Inside Coalition are committed to working in partnership to rekindle the connection between our children and nature by promoting activities and policies for outdoor play, recreational opportunities, hands-on environmental education, and increased knowledge about nature.	http://online.nwf.org/site/PageServer?pagename=ghrc_education_MI_NCLI_main&JServSessionIdr011=419neftf01.app27a
Minnesota	Minneapolis	Minnesota Children & Nature Connection		cyfc@umn.edu
Nebraska	Lincoln	Healthy Families Play Outside	To educate families about the importance of outdoor physical exercise and the benefits inherent in this kind of activity; To introduce Lincoln 's parks and outside spaces to low-income and immigrant families; To provide an incentive for families to get outside and play in Lincoln 's parks and outside spaces; To focus media attention on the need for active, physical, outdoor play and the resources available in Lincoln	http://healthyfamiliesplayoutside.org/

STATE	CITY/AREA	CAMPAIGN NAME	CAMPAIGN DESCRIPTION	CONTACT/WEBSITE
New Hampshire	Concord	Children in Nature Initiative	The New Hampshire Children In Nature Coalition is dedicated to fostering experiences in nature that improve physical and emotional health and well-being, increase understanding of and care for the natural world, promote stronger connections to community and landscape, and to providing a forum for continued collaboration	http://wildnh.com/ChildrenInNature/
New Mexico	Albuquerque	No Child Left Inside Coalition	New Mexico wants to lead the way to a different future with programs and legislation that reconnect children with the outdoors. In 2007, the New Mexico Legislature approved the Outdoor Classrooms Initiative that increased outdoor education in the state.	www.sierraclub.org/youth/newmexico/coalition.aspx
New York	Adirondack	Children in Nature, New York	Children in Nature, New York, is a partnership between the NFL, the New York state Department of Environmental Conservation; Great Play! Lake Placid Sport Summit; Come Out and Play! Children in Nature, Saratoga; and The Wild Center.	pbhai@esf.edu
New York	Albany	Leave No Child Inside	The N.C. Office of Environmental Education's "Discover the World Outside" education campaign is designed for specific audiences such as parents. This campaign helps people find outdoor events and programs near them and provides information on the benefits of spending time outside.	gbyjack@gw.dec.state.ny.us
North Carolina	Durham	Discover the World Outside	The mission of N.C. CAN! (the North Carolina Children and Nature Coalition) is to establish a relationship between the children of North Carolina and the natural world by bringing together people and organizations to strengthen, broaden, and support efforts that build these connections.	www.eenorthcarolina.org/discover.html
North Carolina	Statewide	NCCAN!		www.eenorthcarolina.org/

STATE	CITY/AREA	CAMPAIGN NAME	CAMPAIGN DESCRIPTION	CONTACT/WEBSITE
North Carolina	Raleigh	Take A Child Outside	Designed to help break down obstacles that keep children from discovering the natural world. By arming parents, teachers and other caregivers with resources on outdoor activities, the goal is to help children across the country develop a better understanding and appreciation of the environment in which they live, and a burgeoning enthusiasm for its exploration.	http://takeachildoutside.org/
North Carolina	Burnsville	WNC Kids in Nature Lovers	Networking fellow minded citizens of Western North Carolina to encourage all families and children in the area to get outside!	http://groups.google.com/group/wnc-kids-in-nature-lovers
Ohio	Cincinnati	Leave No Child Inside— Greater Cincinnati	Leave No Child Inside of Greater Cincinnati is a collaboration of organizations and individuals educating the community that time spent in nature is essential for the physical, mental and emotional health of all children.	www.lncigc.org/
Ohio	Regional	NW OH LNCI Collaborative		mary.warren@dnr.state.oh.us
Ohio	Columbus	The Leave No Child Inside Central Ohio Collaborative	In October of 2007, a group of individuals and community organizations around Columbus came together to form The Leave No Child INSIDE Central Ohio Collaborative. The group connects existing natural parks and playspaces with youth and parents, plus child-care facilities and schools, and works to educate the community about the importance of nature to healthy childhood development.	http://kidsandnature.org/blog/

STATE	CITY/AREA	CAMPAIGN NAME	CAMPAIGN DESCRIPTION	CONTACT/WEBSITE
Oklahoma	Oklahoma City	Kirkpatrick Foundation Conservation Education Initiative	The Kirkpatrick Foundation Conservation Education Initiative is a partnership of the Foundation, The Nature Conservancy - Oklahoma Chapter and the Oklahoma Environmental Education Coordinating Committee. The Initiative includes a series of meetings where some 15 organizations and agencies share strategies to promote environmental and conservation education and development of a web site, hosted by The Nature Conservancy.	www.nature.org/wherework/northern/states/oklahoma/
Oregon	Statewide	No Oregon Child Left Inside	The No Oregon Child Left Inside (NOCLI) Coalition is working to pass state legislation in Oregon. NOCLI will establish a state environmental literacy plan, an environmental education grant program and an Environmental Education Advisory Council to guide Oregon in a common strategic vision for environmental education.	www.nocli.org
Pennsylvania	Statewide	Get Outdoors PA	Statewide initiative to get people outdoors	www.demr.state.pa.us/getoutdoorspa/index.html
Pennsylvania	Plumsteadville	No Child Left Inside-Bucks County Coalition	Our mission is to reconnect children with nature thereby improving upon the health and well-being of our children, our environment, and our community as a whole.	www.bringingamericatogether-bucks.com
South Carolina	Regional	No Child Left Inside	To inspire children's attitude and passion towards nature and to foster their ability to access and reconnect to the outdoors.	http://scnaturekids.ning.com/
South Dakota	Pierre	No Child Left Inside	The purpose of Game, Fish & Parks' <i>No Child Left Inside</i> program is to encourage kids - and adults, too! - to go outside and explore the natural world which surrounds them.	www.sdgifp.info/Wildlife/Education/NoChild.htm
Tennessee	Nashville	Tennessee No Child Left Inside Coalition	Stakeholders from across Tennessee are organizing to "get the word out," connecting children with nature through existing programs, family nature clubs, community forums, and a public media campaign.	vera.vollbrecht@nashville.gov

STATE	CITY/AREA	CAMPAIGN NAME	CAMPAIGN DESCRIPTION	CONTACT/WEBSITE
Texas	Austin	Statewide Campaign	The Texas Children in Nature Community brings together groups and individuals who are interested in connecting children with nature. We share resources and are working on: a parents' campaign, Green Ribbon Schools, nearby nature guide for pediatricians and health care providers, nature-based play areas and more.	http://groups.google.com/group/texas-children-in-nature
Utah	Salt Lake City	Regional Campaign		jackisgreene@yahoo.com
Vermont	Bennington	No Child Left Inside	Statewide organizations and agencies collaborating to help reconnect children and others to the outdoors in natural environments through a wide variety of outdoor recreation opportunities, education, physical, cultural and socio-environmental activities	sherry.winnie@state.vt.us
Virginia	Martinsville	Martinsville Henry County Community Nature Initiative	The MHC CNI will serve as a clearinghouse for environmental information, use nature as a way to stimulate learning, develop opportunities for quality family time in the outdoors, and position VMNH as a leader in environmental education.	tamara.poles@vmnh.virginia.gov
Washington	Regional	Regional Campaign		
Wisconsin	Regional	Leave No Child Inside	A regional effort to mobilize community partners, families and educational institutions to leave no child inside through healthy outdoor play, instruction and exploration.	www.naturenet.com
Wyoming	Jackson	No Child Left Inside		jack.shea@tetonscience.org